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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 22, 1985 Volume 1059 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Aug. 28, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 19, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,354,279 through 4,355,423
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,141,788, Re. S.N. 726,965, Filed Apr. 29, 1985, Cl. 162/343, METHOD OF AND MEANS FOR FORMING MULTI-PLY WEBS FROM A SINGLE HEADBOX, Edgar J. Justus, Owner of Record: *Beloit Corp., Beloit, Wis.,* Attorney or Agent: Otto R. Krause, Ex. Gp.: 133

4,190,707, Re. S.N. 512,577, Filed July 11, 1983, Cl. 429/254, ALKALINE BATTERY SEPARATOR, Yoshinao Doi, et al., Owner of Record: *Inventor(s),* Attorney or Agent: Ronald J. Kubovcik, Ex. Gp.: 114

4,397,495, Re. S.N. 772,808, Filed Sept. 5, 1985, Cl. 297/88, AUTOMATIC GRIP CONTROL CIRCUIT FOR A GRAPPLE MECHANISM, Stephen A. M. Lewis, Owner of Record: *Clark Michigan Co., Niles, Mich.,* Attorney or Agent: Kenneth C. Witt, Ex. Gp.: 313

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,923,372, Reexam. No. 90/000,862, Requested: Sept. 18, 1985, Cl. 350/96.24, FIBER OPTIC EXTRA ORAL OPERATORY LIGHT, Max Roland, Owner of Record: *M.-D. T. Instrument Co., Gardena, Calif.,* Attorney or Agent: David V. Trask, Ex. Gp.: 251, Requester: Welch Allyn, Inc., Windham, N.Y.

4,333,286, Reexam. No. 90/000,846, Requested: Aug. 29, 1985, Cl. 52/281, WALLS AND PARTITIONS AND CONCEALED FASTENERS FOR ASSEMBLY THEREOF, Roger Neil Weinar, Owner of Record: *Inventor,* Attorney or Agent: Eric P. Schellin, Ex. Gp.: 354, Requester: Inventor

4,516,937, Reexam. No. 90/000,861, Requested: Sept. 18, 1985, Cl. 433/173, SYSTEM FOR DENTURE SUPPORT USING A TRANSMANDIBULAR IMPLANT, Hans Bosker, Owner of Record: *Inventor, Haren, Netherlands,* Attorney or Agent: John Kane, Ex. Gp.: 330, Requester: Zimmer, Inc., Warsar, Ind.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Ultra Sun, Inc., Atlanta, Ga., Reg. No. 1,209,183, for the mark "THE ULTRA SUN TAN SHOP and design", Canc. No. 14,519.

Aerosence Corp., assignee, by mesne assignment of Maryland Beverage Co., Inc., Nimbus, Calif., Reg. No. 527,045, for the mark "CHOC TREAT", Canc. No. 14,540.

Michigan Abrasive Co., Inc., by change of name from Atlantic Abrasive Corp., South Braintree, Mass., Reg. No. 592,342, for the mark "ATLANTIC", Canc. No. 14,709.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40104-4151]
Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; correction.
Summary: This document corrects clerical errors and adds material to the Analysis of Comments in the notice of final rule amending the Patent and Trademark rules of practice in patent interference cases, which were published in the Official Gazette of Jan. 29, 1985 (1050 OG 385 through 440).
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

Clerical Correction to the Preamble

The following corrections are made to the Official Gazette issue of Jan. 29, 1985:

Page 386

1. In the second column, line 32 (the fifth full paragraph, the second sentence) the word "an" is inserted after the word "or"

Page 387

2. In the second column, line 48 (the fifth full paragraph), after the word "agent", the following words "of record" are inserted.

Page 388

3. In the first column, line 29 (the first full paragraph, the third sentence), the words "of an interference" are removed and the words "in an interference" are inserted in their place; in line 39 (the first full paragraph, the last sentence), the words "Federal Rule" are removed and the words "Federal Rules" are inserted in their place; in line 41 (the second full paragraph, the first sentence), the word "provide" is removed and the word "provides" is inserted in its place.

4. In the second column, line 29 (the second full paragraph, the second sentence), the word "defined" is removed and the word "defines" is inserted in its place; in line 45 (the second full paragraph, the last sentence), the spelling of the word "in" is corrected; in line 48 (the last paragraph, the first sentence), the words "one of " are removed and the words "one or" are inserted in their place.

Page 391

5. In the second column, line 59 (the paragraph bridging the third column, the second sentence), quotation marks are placed around the word "lead".

6. In the third column, line 44 (the second full paragraph, the fourth sentence), the article "a" is inserted before the word "sanction".

Page 392

7. In the first column, line 12 (the second full sentence from the top of the page), the word "proposed" is removed; in line 30 (the seventh full sentence from the top of the page), the words "and applicant" are removed and the words "an applicant" are inserted in their place; in line 55 (the first full paragraph, the second sentence), the colon appearing after the word "appropriate" is deleted and a period is inserted in its place.

8. In the third column, line 5, the first letter of the word "while" is capitalized.

Page 394

9. In the second column, line 13 (the first full paragraph, the fourth sentence), the spelling of the word "Consultation" is corrected.

Page 395

10. In the first column, line 44 (the second full paragraph, the last sentence), the spelling of the word "necessary" is corrected; in line 59 (the last paragraph, the first sentence), the spelling of the word "specifies" is corrected.

11. In the second column, line 1, the word "the" is inserted after the word "and"; in line 14 (the first full paragraph, the third sentence), the words "is required" are removed and the words "are required" are inserted in their place.

Page 396

12. In the first column, line 5, the word "of" is removed.

13. In the second column, line 13 (the first full paragraph, the fourth sentence), the word "Claims" is removed and the word "Claim" inserted in its place.

Page 397

14. In the second column, line 2, the words "would be" are removed and the word "is" is inserted in its place; in line 6, the word "intended" is removed and the word "intends" is inserted in its place.

Page 399

15. In the second column, line 41 (the fifth full paragraph), the word "had" is removed and the word "has" is inserted in its place.

16. In the third column, line 37 (the third full paragraph, the last sentence), the comma after the word "language" is removed; in line 38, the comma after the word "affidavit" is removed.

Page 401

17. In the first column, line 11 (the first full paragraph, the first sentence), the words "of sale" are removed and the words "or sale" are inserted in their place.

Page 402

18. In the first column, line 4, the word "over" is removed and the word "of" is inserted in its place.

Page 403

19. In the first column, line 2, the spelling of the word "arguably" is corrected; in line 9, the spelling of the word "definitions" is corrected.

Page 404

20. In the first column, line 18 (the second full paragraph, the fourth sentence), the words "PTO was" are removed and the words "PTO were" are inserted in their place.

21. In the second column, line 26 (the first full paragraph, the fourth sentence), the spelling of the word "under" is corrected.

Page 406

22. In the third column, line 21 (the first full paragraph, the third sentence), a closing quotation mark is placed after the word "opponents's".

Page 407

23. In the first column, line 4 (the first full paragraph, the first sentence), the spelling of the word "suggested" is corrected.

Page 409

24. In the first column, line 21 (the first full paragraph, the third sentence), the words "do not" are inserted after the word "rules".

25. In the third column, line 33 (the first full paragraph, the first sentence), the word "is" is inserted before the word "excluded".

Page 411

26. In the third column, line 26 (the third full paragraph, the third sentence), the word "permitting " is removed and the word "permitted" is inserted in its place.

Page 413

27. In the second column, line 47 (the second full paragraph, the second sentence), the reference to "1.644(b)" should read "1.644(a)(2)".

28. In the third column, line 59 (the last paragraph, the first sentence), the first letter of the word "Interference" is made lower case.

Page 416

29. In the first column, line 1, the word "opponent's" is removed and the word "opponents" is inserted in its place.

30. In the second column, line 40 (the first full paragraph, the second sentence), the reference to "1662(a)" should read "1.662(a)"; in line 45 (the first full paragraph, the third sentence), the reference to "1633(d)" should read "1.633(d)".

Page 417

31. In the second column, line 49 (the second full paragraph, the third sentence from the end), quotation marks are placed around the word "things"; in line 55 (the second full paragraph, the last sentence), the word "to" is inserted after the words "should resort".

32. In the third column, line 11 (the first full sentence from the top of the page), the colon after the word "controversy" is removed and a period is inserted in its place; in line 54 (the first full paragraph, the penultimate sentence), the spelling of the word "appropriate" is corrected.

Page 418

33. In the second column, line 16 (the first full paragraph, the first sentence), the first letter of the word "Commentator's" is made lower case.

Page 419

34. In the table correlating the old rules 37 CFR 1.201 through 1.288 to the new rules 37 CFR 1.601 through 1.688, the following corrections are made to the entries under the section, designated as new:

RULE CORRELATION TABLE

Old	New
1.201(a)	1.601(i)
1.201(b)	1.601(i)
1.203(a)	1.603
1.204(b)	1.608(a)
1.204(c)	1.608(b)
1.205(a)	1.606
1.208	1.613(b)
1.216(b)	1.623(c), 1.624(c), 1.625(c)
1.245	1.645(a)
1.246	1.645(b)
1.257(b)	1.658(c)
1.263	1.622(c)
1.264	1.662(b)
1.271	1.671(h)
1.272(b)	1.672(d)
1.272(c)	1.672(e), (f)
1.281	1.645(a)
1.287(b)	1.687(b)
1.287(c)	1.687(c)

Additional Analysis of Comments

Page 404

1. In the second column after the last full paragraph, the following paragraph is added:

An oral comment was received by telephone concerning the declaration of an interference under §§1.603 and 1.606 with applications filed under the provisions of 35 U.S.C. 157—Statutory Invention Registration (SIR). Under 35 U.S.C. 157(c), a published SIR has all of the attributes specified for patents except those specified in 35 U.S.C. 183 and 271 to 289. Consequently, interferences will be declared between an application and either an application containing a request for a SIR (37 CFR 1.293) or a published SIR. Until sufficient experience is gained by the PTO, the interference will be conducted by procedure established on a case by case basis.

Page 415

In the second column, after the first full paragraph, the following paragraph is added:

Oral comments have been received by telephone concerning the doctrine of interference estoppel under 37 CFR 1.658(c) with respect to a party's failure to move under 37 CFR 1.633(e) to declare an "additional interference" between an additional application not involved in the interference and owned by the party and an opponent's application or patent involved in the interference on a separate patentable invention. Generally a party will be estopped for failure to move when the separate patentable invention (subject matter) which could have been the subject of the "additional interference" was *claimed* (during the pendency of the interference) (1) in the opponent's involved application or patent or (2) in a non-involved application owned by the party.

The following illustrates the general applicability of interference estoppel in certain situations where a party fails to move under 37 CFR 1.633(e) to declare an "additional interference" on a separate patentable invention.

Party's non-involved application	Opponent's involved application or patent	Estoppel
Claimed	Claimed	Yes
Disclosed	.do	Yes
Claimed	Disclosed	Yes
Disclosed	.do	No

Clerical Corrections to the Rules

1. On page 420 the second column, the amendment to §1.8, amendatory instruction 4 is corrected by changing "paragraph (a)(xii) to read "paragraph (a)(2)(xii)".

2. On page 421, the second column, in the second sentence of §1.59, the spelling of the word "required" is corrected and the reference to "§1.21(1)" is corrected to read "§1.21(*l*)".

3. On page 423, the third column, §1.324 is corrected by inserting in the second sentence the article "a" before the word "patent".

4. On page 424, the first column, in §1.565, in the first sentence of paragraph (b), "in filed" should have read "is filed".

5. On page 425, the first column, the last sentence of § 1.601(i) is corrected by removing the last occurrence of the word "patents" and inserting, in its place, the word "patent".

6. On page 425, the first column, §1.601(k) is corrected by removing the words "and interference" and inserting, in their place, the words "an interference".

7. On page 425, the second column the second sentence of §1.601(n) is corrected by removing the words "a invention" and inserting, in their place, the words "an invention".

8. On page 427, the first column, §1.611(d)(2) is corrected by inserting the word "in" after the word "provided".

9. On page 427, the second column, the reference to "1.608(b)" in the first sentence of §§1.612(a), 1.612(b) and 1.612(c) is corrected to read "1.608".

10. On page 427, the third column, the first sentence of §1.615(a) is corrected by placing in italics the words "ex parte".

11. On page 427, the third column, the second sentence of §1.616 is corrected by changing to upper case the first letter of the words "holding", "precluding" and "granting" in paragraphs (a) to (e).

12. On page 428, the first column, the first sentence of §1.617(b) is corrected by removing the first occurrence of the word "any" and inserting, in its place, the word "may".

13. On page 428, the first column, the last sentence of §1.617(b) is corrected by inserting the words "on each opponent" after the words "shall serve".

14. On page 428, the first column, the last sentence of §1.617(d) is corrected by removing the words "an oral" and inserting, in their place, the article "a".

15. On page 428, the first column, the last sentence of §1.617(g) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

16. On page 428, the second column, the second sentence of §1.621(a) is corrected by inserting the word "by" after the first occurrence of the word "or".

17. On page 428, the second column, the first sentence of §1.621(b) is corrected by inserting a comma after the first occurrence of word "statement".

18. On page 428, the third column, the first sentence of §1.624(a) is corrected by removing the semicolon appearing after the word "count" and inserting, in its place, a colon.

19. On page 430, the first column, the last sentence of §1.631(a) is corrected by removing the words "a party shall serve copies of its preliminary statement on every opponent" and inserting, in their place, the words "a party shall serve a copy of its preliminary statement on each opponent".

20. On page 430, the first column, the heading of § 1.633 is corrected by changing to lower case the first letter of the word "Motions".

21. On page 430, the third column, in §1.636(b) the reference to "§1.633(a), (b), or (g)" is corrected to read "§1.633(a), (b), (c)(1), or (g)".

22. On page 431, the second column, in §§1.637(d)(2) and 1.637(e)(1)(ii) the reference to "§1.608(b)" is corrected to read "§1.608".

23. On page 431, the second column, §1.637(e)(1)(iv)

is corrected by removing the words "a claim" and inserting, in their place, the words "any claim".

24. On page 431, the third column, §1.637(e)(2)(iii) is corrected by removing the first occurrence of the word "party's" and inserting, in its place, the word "party".

25. On page 431, the third column, the second sentence of §1.637(e)(2)(iv) is corrected by removing the two occurrences of the word "claims" and inserting, in their place, the word "claim".

26. On page 431, the third column, in the first sentence of §1.637(f)(2), the reference to "§1.608(b)" is corrected to read "§1.608".

27. On page 432, the first column, §1.637(h)(3) is corrected by removing the words "a claim" and inserting, in their place, the words "any proposed claim".

28. On page 432, the second column, §1.640(b)(2) is corrected by removing the words "entered or" and inserting, in their place, the words "entered on".

29. On page 432, the third column, the penultimate sentence of §1.640(c) is corrected by inserting the article "a" before the words "single examiner-in-chief".

30. On page 432, the third column, §1.640(d)(1) is corrected by removing the words "all counts" and inserting, in their place, the words "any count".

31. On page 432, the third column, the first sentence of §1.640(e) is corrected by removing the word "filed" and inserting, in its place, the word "files".

32. On page 433, the second column, §1.644(i) is corrected by removing the word "petition" and inserting, in its place, "petitions".

33. On page 433, the second column, the first sentence of §1.645(a) is corrected by inserting the word "or" after "§§1.302," and after "§§1.303,".

34. On page 433, the third column, in the first sentence of §1.646(a), the spelling of the word "every" is corrected.

35. On page 433, the third column, §1.646(c) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

36. On page 434, the third column, §1.653(c)(5) is corrected by removing the word "an" and inserting, in its place, the word "and".

37. On page 434, the third column, the last sentence of §1.653(g) is corrected by removing the word "found" and inserting, in its place, the word "bound".

38. On page 435, the first column, the penultimate sentence of §1.653(i) is corrected by removing the words "and exhibit" and inserting, in their place, the words "an exhibit".

39. On page 436, the third column, the second sentence of §1.664(a) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

40. On page 437, the first column, the last sentence of §1.666(c) is corrected by removing the word "Commission" and inserting, in its place, "Commissioner".

41. On page 437, the second column, the first sentence of §1.671(b) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

42. On page 437, the second column, in the first sentence of §1.671(e) the reference to "§1.608(b)" is corrected to read "§1.608".

43. On page 437, the third column, the third sentence of §1.672(b) is corrected by removing the words "a party shall file" and inserting, in their place, the words "a party should file".

44. On page 438, the third column, in §1.676(a), the spelling of the third occurrence of the word "transcript" is corrected.

45. On page 440, the first column, the second sentence of §1.684(c)(6) is corrected by removing the words "a witness refused to read" and inserting, in their place, the words "a witness refuses to read".

46. On page 440, the second column, §1.685(c) is corrected by inserting the word "or" after the first occurrence of the word "error," and by removing the word "indorsed" and inserting, in its place, the word "endorsed".

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 21, 1985.

[FR Doc. 85-13077 Filed 5-30-85; 8:45 am]
Billing Code 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Oct. 22, 1985

Re. 31,948	4,484,286	4,511,566	4,524,087
4,349,622	4,484,752	4,511,578	4,524,226
4,352,334	4,484,928	4,512,001	4,524,228
4,366,165	4,485,092	4,512,008	4,524,251
4,381,599	4,485,247	4,512,015	4,524,499
4,383,142	4,485,829	4,512,189	4,524,549
4,388,825	4,486,724	4,512,434	4,525,117
4,390,342	4,487,710	4,512,460	4,525,212
4,395,797	4,488,194	4,512,716	4,525,244
4,402,200	4,488,367	4,513,234	4,525,256
4,403,181	4,488,899	4,513,236	4,525,321
4,407,945	4,489,127	4,514,248	4,525,380
4,412,285	4,489,203	4,514,279	4,525,620
4,412,742	4,489,270	4,514,600	4,525,635
4,417,966	4,489,966	4,514,699	4,525,754
4,419,375	4,490,060	4,514,803	4,525,889
4,420,756	4,490,492	4,514,824	4,525,982
4,422,447	4,490,568	4,514,887	4,526,230
4,423,332	4,490,707	4,515,061	4,526,293
4,426,519	4,491,154	4,515,231	4,526,326
4,427,299	4,491,800	4,515,571	4,526,511
4,429,397	4,491,803	4,515,757	4,526,905
4,429,604	4,493,746	4,515,834	4,526,973
4,429,958	4,493,796	4,515,911	4,527,081
4,431,895	4,494,459	4,515,972	4,527,338
4,432,972	4,494,795	4,516,535	4,527,516
4,434,830	4,495,794	4,516,643	4,528,349
4,437,439	4,496,077	4,516,710	4,528,378
4,439,230	4,497,634	4,516,851	4,528,826
4,440,069	4,497,682	4,517,277	4,529,184
4,441,444	4,497,713	4,518,279	4,529,210
4,443,826	4,498,140	4,518,310	4,529,331
4,445,410	4,499,170	4,518,436	4,529,373
4,446,224	4,499,531	4,518,703	4,529,467
4,446,353	4,499,787	4,518,773	4,530,002
4,448,877	4,500,188	4,518,875	4,530,088
4,450,624	4,500,225	4,520,104	4,530,149
4,452,179	4,501,537	4,520,659	4,530,455
4,452,226	4,502,014	4,521,163	4,530,479
4,452,986	4,502,788	4,521,217	4,530,537
4,454,494	4,503,038	4,521,539	4,530,582
4,455,271	4,503,224	4,521,886	4,530,722
4,459,709	4,503,278	4,521,915	4,530,724
4,460,363	4,503,331	4,522,070	4,530,782
4,461,867	4,504,084	4,522,221	4,530,910
4,462,916	4,504,373	4,522,751	4,531,042
4,468,784	4,504,429	4,522,796	4,531,730
4,469,528	4,505,433	4,522,798	4,531,890
4,470,451	4,505,884	4,522,949	4,532,165
4,470,714	4,506,129	4,522,995	4,532,331
4,472,199	4,506,359	4,523,153	4,534,006
4,474,664	4,507,293	4,523,155	4,534,333
4,475,013	4,508,369	4,523,230	4,534,436
4,477,882	4,508,448	4,523,273	4,535,021
4,478,170	4,508,726	4,523,392	4,535,389
4,478,791	4,508,921	4,523,513	4,535,857
4,481,268	4,509,752	4,523,713	4,539,497
4,481,585	4,509,857	4,523,736	
4,483,610	4,511,209	4,523,742	
4,484,223	4,511,470	4,524,006	

Erratum

In the notice of Certificates of Correction appearing at 1052 O. G. 42 in the Official Gazette of Mar. 12, 1985, all references to Patent No. 4,324,855, should be deleted as the Certificate issued in error.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 31, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-26-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-27-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-22-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-16-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during August 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,395,406 to 3,399,405, inclusive

Plant Patents . . . . . Numbers 2,825 to 2,829 inclusive

REEXAMINATIONS

OCTOBER 22, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 30,035 (403rd)
ARTICULATED LINK CONVEYOR

Eldon S. Miller, 5132 San Jose, Tampa, Fla. 33609

Reexamination Request No. 90/000,673, Nov. 30, 1984.

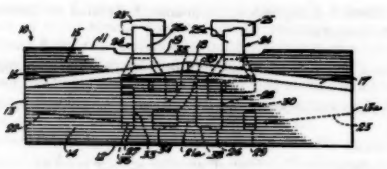
Reexamination Certificate for Reissue Patent Re. 30,035, issued Jun. 19, 1979, Ser. No. 791,539, Apr. 27, 1977.

Original No. 3,653,494, dated Apr. 4, 1972, Ser. No. 37,155, May 14, 1970. Continuation of Ser. No. 623,485, Oct. 17, 1975, abandoned, which is a continuation of Ser. No. 455,802, Mar. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 769,248, Oct. 21, 1968, Pat. No. 3,513,965, which is a continuation-in-part of Ser. No. 655,401, Jul. 24, 1967, abandoned.

The portion of the term of this patent subsequent to May 26, 1987, has been disclaimed.

Int. Cl.[4] B65G *15/30*

U.S. Cl. 198—850



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–2** is confirmed.

1. A link for articulated-link conveyors comprising, in combination, a substantially rectangular elongated link member having an upper support surface and front and back of edges, mechanism for interconnecting said link member with successive identical link members so as to form a belt-like conveyor of transversely extending articulated links, said interconnecting means being loose enough to permit angular movements in a common plane of the individual links of a plurality of articulated links, and means for overlapping mutually adjacent articulated links to permit their "fanning out" in such angular movements to substantially eliminate separation of their front and back edges, said overlapping means comprising a downwardly stepped surface portion in the front portion of said upper support surface and an upwardly stepped surface portion in the rear portion of the bottom of said link member, said downwardly stepped surface portion of one link being of such size and shape as to be nestingly interfitted in face-to-face relation with the upwardly stepped surface portion of an adjacent articulated link member, the zone of demarcation between the stepped upper surface portions being defined by an inclined riser surface portion presenting obtuse angular inner and outer corner edges therealong, said zone of demarcation defining, along its length, an obtuse angle the apex of which is centrally disposed with respect to the front edge of the link member.

B1 4,209,924 (404th)
MARKING TAG

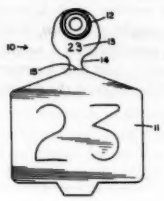
D. David Fearing, Mahtomedi, Minn., assignor to Fearing Manufacturing Co., Inc., South St. Paul, Minn.

Reexamination Request No. 90/000,156, Feb. 8, 1982.

Reexamination Certificate for Patent No. 4,209,924, issued Jul. 1, 1980, Ser. No. 927,990, Jul. 26, 1978.

Int. Cl.[4] A01K *11/00;* **G09F** *3/06*

U.S. Cl. 40—301



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

Claims **10–14** are cancelled.

1. An animal identification tag comprising:

a first portion comprised of a flexible material and including an area for an animal identification indicia;

a second portion comprised of a flexible material and including an area for an animal identification indicia, attachment means on said second portion for connecting said second portion to an animal's ear;

said attachment means includes a flanged impaler for fastening said animal identification tag to the animal's ear;

said flanged impaler comprising two materials, a first softer material for fastening through the animal's ear and a second harder material for penetrating the animal's ear; and

a neck connecting said first portion to said second portion with said neck having a region sufficiently weakened so that in the event an animal snags said first portion said first portion separates from said second portion without pulling said second portion from the animal's ear.

B1 4,389,393 (405th)
SUSTAINED RELEASE THERAPEUTIC COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT HYDROXYPROPYLMETHYLCELLULOSE

Joseph M. Schor, Locust Valley; Ashok Nigalaye, Jackson Heights, both of N.Y., and Norman G. Gaylord, New Providence, N.J., assignors to Forest Laboratories, Inc., New York, N.Y.

Reexamination Request Nos. 90/000,713, Jan. 23, 1985 and 90/000,461, Oct. 18, 1983.

Reexamination Certificate for Patent No. 4,389,393, issued Jun. 21, 1983, Ser. No. 362,104, Mar. 26, 1982.

Int. Cl.[4] A61K *9/50*

U.S. Cl. 424—19

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–10** are cancelled.

New claims **11–22** are added and determined to be patentable.

11. A carrier base material combined with a therapeutically active medicament and shaped and compressed to a solid unit dosage form having a regular and prolonged release pattern upon administration, the carrier base material comprising one or more hydroxypropylmethylcelluloses or a mixture of one or more hydroxypropylmethylcelluloses and up to 30% by weight of the mixture of methyl cellulose, sodium carboxymethylcellulose and/or other cellulose ether, and wherein at least one of the hydroxypropylmethylcelluloses has a methoxy content of 16–24 weight-%, a hydroxypropoxyl content of 4–32 weight-%, and a number average molecular weight of at least 50,000 and wherein the carrier base material constitutes 25.8 weight-% or less of the solid unit dosage form and at least four hours are required for release of 94.4% of the medicament from the dosage form following administration.

B1 4,412,573 (406th)

INJECTION SITE

Brian D. Zdeb, Round Lake Park, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Reexamination Request No. 90/000,730, Feb. 25, 1985.
Reexamination Certificate for Patent No. 4,412,573, issued Nov. 1, 1983, Ser. No. 335,133, Dec. 28, 1981.
Int. Cl.⁴ B65D *41/50*
U.S. Cl. 604—415

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–21** is confirmed.

New claims **22–29** are added and determined to be patentable.

1. A needle-pierceable injection site comprising:

a generally tubular port including a base end and a top end;

a needle-pierceable membrane extending across and closing said base end;

said generally tubular port and needle-pierceable membrane defining a volume, said top end defining a substantially circular opening to said defined volume; and

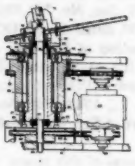
a needle-pierceable compressed situs of self-sealing material having the form of a sphere in its unstressed state, disposed in said generally tubular port and retained in compressive sealing relation thereto.

B1 4,429,808 (407th)

DUAL DRIVE ROTARY FEEDER

Myron L. Doty, Greenwood, Ind., assignor to Moorfeed Corporation, Indianapolis, Ind.

Reexamination Request No. 90/000,697, Dec. 21, 1984.
Reexamination Certificate for Patent No. 4,429,808, issued Feb. 7, 1984, Ser. No. 331,624, Dec. 17, 1981.
Int. Cl.⁴ B65H *3/42*
U.S. Cl. 221—167



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–8**, dependent on an amended claim, are determined to be patentable.

New claims **9–11** are added and determined to be patentable.

1. An apparatus for feeding articles in serial order comprising:

a base,

a substantially horizontal, annular surface rotatably movable with respect to the base about an axis perpendicular to the base,

a cylindrical wall subtending from the inner periphery of the annular surface and rotatably movable therewith,

an inclined support surface fixed stationary relative to the base, *the axis passing through the support surface*, the point of intersection of the support surface with the axis being positioned substantially midway between the plane of the annular surface and the lowest extent of *an article-contacting portion of* the cylindrical wall, and

a *planar* disc mounted for rotational movement on the support surface substantially concentric with the axis, the periphery of the disc being immediately adjacent to the cylindrical wall, the disc being inclined by the support surface such that the uppermost portion of the periphery of the disc is immediately adjacent the annular surface, *the disc remaining planar during rotation.*

B1 4,439,130 (408th)

PLASTIC TILE CORRUGATOR

Heinrich Dickhut, Chebanse, and Alfred Lilienthal, Bourbonnais, both of Ill., assignors to Cullom Machine Tool & Die, Inc., Cullom, Ill.

Reexamination Request No. 90/000,639, Sep. 25, 1984.
Reexamination Certificate for Patent No. 4,439,130, issued Mar. 27, 1984, Ser. No. 324,371, Nov. 23, 1981.
Int. Cl.⁴ B29C *17/07*
U.S. Cl. 425—388

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **17–26** is confirmed.

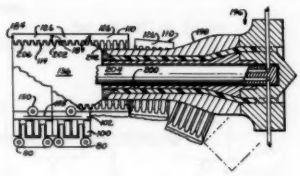
Claims **1**, **5**, **7**, **8**, **14** and **16** are determined to be patentable as amended.

Claims **2–4**, **6**, **9–13** and **15**, dependent on an amended claim, are determined to be patentable.

1. A corrugator for receiving plastic from an extruder to form corrugated tile therewith, said corrugator comprising:

a frame having an endless *stationary* trackway thereabout, a portion of said trackway defining a molding section;

a plurality of [disconnected] mold assemblies *disconnected from each other*, each *assembly being* rollably disposed [on] *for travel along* said trackway, each of said mold



assemblies [pivotally opening and closing] *including* a pair of mold blocks [which when] *pivotable between a* closed [define] *condition defining* a segment of a corrugated molding tunnel *and an open condition;*

rolling followers disposed on each of said mold assemblies, said followers rollably following cam surfaces to effectuate opening and closing of said mold blocks;

means for driving said mold assemblies to rollably circulate about said trackway, said mold blocks of adjacent mold assemblies being arranged contiguously along said molding section to cooperate to define a corrugated molding tunnel to receive, move with, and form a corrugated tile.

B1 4,445,789 (409th)

THERMOMETER OF OTHER INSTRUMENT ASSEMBLY

Edward L. Peart, Arden, and Charlie J. Howard, Fairview, both of N.C., assignors to Sybron Corporation, Rochester, N.Y.

Reexamination Request No. 90/000,680, Dec. 4, 1984.
Reexamination Certificate for Patent No. 4,445,789, issued May 1, 1984, Ser. No. 382,995, May 28, 1982.
Int. Cl.[4] **G01K** *5/68;* **A47G** *35/00*
U.S. Cl. 374—198

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

Claims **13** and **15** are cancelled.

Claims **8**, **10**, **12**, and **14** are determined to be patentable as amended.

Claims **9** and **11**, dependent on an amended claim, are determined to be patentable.

1. An instrument assembly comprising a movement, case structure, crystal structure, and adjustment means said movement comprising condition responsive means, an indicator means having pointer means and scale means, said condition responsive means being responsive to said condition for moving one of said pointer means and said scale means with respect to the other thereof along a given path such that the relative positions thereof along said path indicate values of said condition;

said pointer means and said scale means being mounted one in said case structure and one on said crystal structure, and both said pointer means and said scale means being visible through said crystal structure such that said relative positions are exteriorly visible;

said crystal structure being movably mounted in said case structure by said adjustment means, said adjustment means including means having interdigitated digital elements normally fixing said crystal structure in position, but yielding to a sufficient quantum of force manually exerted on said crystal and along said path such as to constrain said crystal to move freely for only a discrete amount corresponding to one or several of said digital elements.

B1 4,477,450 (410th)

TRIAZOLO[4,3,-c]PYRIMIDINES SUBSTITUTED BY NITROGEN-CONTAINING HETEROCYCLIC RINGS

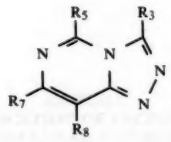
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Reexamination Request No. 90/000,714, Jan. 23, 1985.
Reexamination Certificate for Patent No. 4,477,450, issued Oct. 16, 1984, Ser. No. 471,837, Mar. 3, 1983.
Int. Cl.[4] **A61K** *31/535, 31/54;* **C07D** *487/04*
U.S. Cl. 514—222

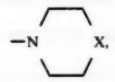
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A compound of the formula:



wherein R_3 is hydrogen or lower alkyl; one of R_5 and R_7 is the heterocyclic substituent



wherein X is oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or N-lower alkylimido; when R_5 is said heterocyclic substituent, R_7 is hydrogen or lower alkyl, when R_7 is said heterocyclic substituent, R_5 is hydrogen, lower alkylthio, phenyl or lower alkyl; and R_8 is hydrogen, phenyl or lower alkyl; or a pharmaceutically acceptable salt thereof.

6. A method for obtaining bronchodilation in a mammal, comprising administering an effective amount of a compound according to claim **1** to said mammal.

REISSUES

OCTOBER 22, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,008

PROCESS FOR MANUFACTURING PLASTICALLY DEFORMED LIGHT METAL OBJECTS HAVING A CONNECTOR PART OF A DIFFERENT METAL

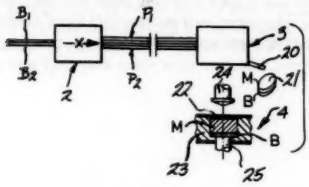
Alfred Wagner, Steisslingen; Adolf Ames, Hilzingen, and Ulf Hodel, Engen, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Original No. 4,397,413, dated Aug. 9, 1983, Ser. No. 256,292, Apr. 22, 1981. Application for reissue Dec. 7, 1984, Ser. No. 679,400

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017106

Int. Cl.[4] B23K *28/00*

U.S. Cl. 228—155 8 Claims



1. A process for manufacturing deep drawn plastically deformed light metal objects having a light metal component joined securely to a heavy metal component comprising the steps of:

supplying a light metal component to an extrusion die;

supplying a heavy metal component to said die for extrusion along with said light metal component whereby said heavy metal component is joined to said light metal component during the extrusion; and

[deep drawing] *impact extruding* said light metal component while said heavy metal component remains joined to said light metal component.

Re. 32,009

DEGASSING MOLTEN SULFUR

Thomas H. Ledford, Baton Rouge, La., and Howard Lerner, Parsippany, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Original No. 4,299,811, dated Nov. 10, 1981, Ser. No. 174,504, Aug. 1, 1980. Application for reissue Apr. 15, 1982, Ser. No. 368,748

Int. Cl.[4] C01B *17/027*

U.S. Cl. 423—578 R 7 Claims

1. A method for reducing the hydrogen sulfide and hydrogen polysulfides concentration in molten sulfur comprising the addition to the molten sulfur of an effective amount of a degassing agent, said degassing agent selected from the class consisting of inorganic [phosphorous] *phosphorus* compounds, urea and urea derivatives without the further addition to the molten sulfur of sulfur dioxide *and/or a gas which oxidizes molten sulfur to sulfur dioxide.*

Re. 32,010

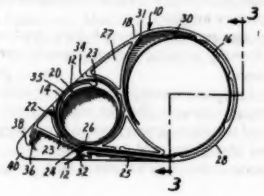
DISPENSER FOR LINER-WOUND TAPE

Philip W. Collins, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,330,357, dated May 18, 1982, Ser. No. 199,742, Oct. 23, 1980. Application for reissue Mar. 5, 1984, Ser. No. 586,209

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—527 3 Claims



3. A hand-held dispenser by which lengths of pressure-sensitive adhesive coated tape may be withdrawn from a supply roll of said tape convolutely wound with a release liner between its coils, said dispenser comprising walls defining:

a first cavity adapted for storing said supply roll;

a second cavity adapted for storing said liner;

a tape outlet opening communicating with said first cavity; and

path means for connecting said cavities to guide said liner from said first cavity into said second cavity and for separating said liner from tape being withdrawn from said opening to that tape being withdrawn from said opening will propel said liner along said path means and into said second cavity.

Re. 32,011

ULTRAPURIFICATION OF FACTOR VIII USING MONOCLONAL ANTIBODIES

Theodore S. Zimmerman, and Carol A. Fulcher, both of La Jolla, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Original No. 4,361,509, dated Nov. 30, 1982, Ser. No. 330,105, Dec. 14, 1981. Application for reissue Dec. 21, 1983, Ser. No. 563,795

Int. Cl.[4] C07G *7/00;* A61K *35/14*

U.S. Cl. 260—112 B 36 Claims

30. An improved method of preparing Factor VIII procoagulant activity protein comprising the steps of

(a) adsorbing a VIII:C/VIII:RP complex from a plasma or commercial concentrate source onto a substrate to which is bound a monoclonal antibody specific to VIII:RP,

(b) eluting the VIII:C,

(c) adsorbing the VIII:C obtained in step (b) in another adsorption to concentrate and further purify same,

(d) eluting the adsorbed VIII:C, and

(e) recovering highly purified and concentrated VIII:C.

Re. 32,012

SPOKEN WORD CONTROLLED AUTOMATIC DIALER

Frank C. Pirz, Madison; Lawrence R. Rabiner; Aaron E. Rosenberg, both of Berkeley Heights, and Jay G. Wilpon, Warren, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,348,550, dated Sep. 7, 1982, Ser. No. 128,842, Mar. 10, 1980. Application for reissue Sep. 7, 1984, Ser. No. 648,691

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—43 **18 Claims**

17. A voice responsive repertory dialing circuit comprising:

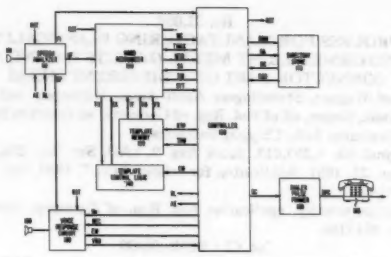
a memory for storing a plurality of template signals representative of the acoustic features of reference words including repertory words;

a directory store for storing a set of dialing signals corresponding to said repertory words;

a speech analyzer responsive to each input spoken word utterance for forming acoustic feature signals representative of said utterance;

a spoken word recognizer jointly responsive to said input spoken word utterance acoustic feature signals from said speech analyzer and template signals from said memory for generating a signal identifying said input utterance;

means responsive to the input utterance identifying signal corresponding to a repertory word template for retrieving the corresponding dialing signal from said directory store; and



means responsive to each occurring input utterance identifying signal for selecting at least one template signal to identify the next occurring input utterance.

PLANT PATENTS

GRANTED OCTOBER 22, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,575

ROSE PLANT KORFLUG

Reimer Kordes; Werner Kordes, and Hermann Kordes, all of Sparrieshoop, Fed. Rep. of Germany, assignors to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 25, 1983, Ser. No. 554,887

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its production of cuttable buds on medium length stems, the buds being of a light pink color with very stiff petals.

5,576

ROSE PLANT JACARET

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 2, 1983, Ser. No. 557,198

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of high production of small red buds; small, open blooms; fragrance; and a good degree of resistance to rose powdery mildew.

PATENTS

GRANTED OCT. 22, 1985

ERRATA

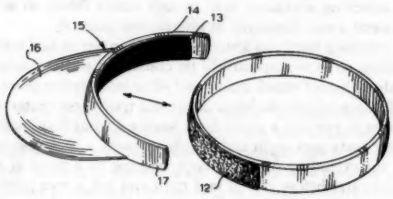
For CLASS	See PATENT NO.
623–018	4,547,910
623–003	4,547,911
623–016	4,547,912
623–027	4,547,913
623–006	4,547,914
623–006	4,547,915
303–007	4,547,967
081–022	4,548,248
128–774	4,548,289
005–016	4,548,619
005–204	4,548,622
514–263	4,548,818
514–261	4,548,819
514–255	4,548,820
426–111	4,548,852
427–096	4,548,879
424–118	4,548,974

PATENTS

GRANTED OCTOBER 22, 1985

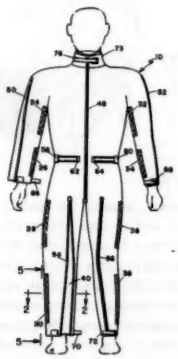
GENERAL AND MECHANICAL

4,547,903
SWEAT BAND APPARATUS
Larry L. Brown, 807 W. Minnesota, Lantana, Fla. 32460, and Jerry H. Lisle, 109 18th St., Belleair Beach, Fla. 22535
Continuation-in-part of Ser. No. 672,779, Apr. 1, 1976, abandoned. This application May 22, 1978, Ser. No. 908,573
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—12 **11 Claims**



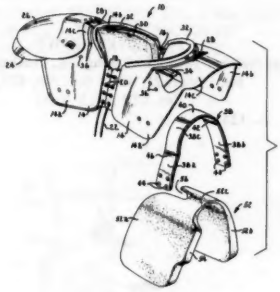
1. A sweat band visor apparatus comprising in combination:
a sweat band made out of moisture absorbing material and shaped to fit around the forehead of a user;
at least one strip of hook and loop material attached to said sweat band and extending a portion of a way around said sweat band; and
a moldable plastic sun visor having an elongated, arcuate surface curved for fitting adjacent a person's forehead and extending to the sides of the forehead of a user, said arcuate surface having a strip of hook and loop material attached thereto for attaching to the coacting hook and loop material on said sweat band, thereby allowing rapid attachment or removal of a sun visor as needed by the user.

4,547,904
SURVIVAL SUIT
Richard W. Long, and Robert T. Stinton, both of San Diego, Calif., assignors to Diving Unlimited International, Inc., San Diego, Calif.
Filed Nov. 12, 1982, Ser. No. 441,068
Int. Cl.[4] A62B *17/00*
U.S. Cl. 2—2.1 R **10 Claims**



1. A survival suit for protecting the user from exposure to dangerous conditions including exposure in water, comprising:
a suit including arm, leg and torso portions made of a material that passes water vapor and that does not pass liquid water;
access means in the torso of said suit for facilitating donning and removal of the suit when open and for providing a water tight seal when closed;
means for adjusting the arm and leg portions of said suit to fit snugly around the arms and legs of the user; and
openings in the arm and leg portions of said suit for easing the restriction of the arms and legs of the user by the arm and leg portions of said suit and closable separately from the adjusting means by closure means for providing a watertight seal.

4,547,905
ATHLETIC SHOULDER PAD
Phil LaPorta, Jr., 1111 N. Glenstone, Springfield, Mo. 65802
Filed Mar. 26, 1984, Ser. No. 593,543
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **12 Claims**



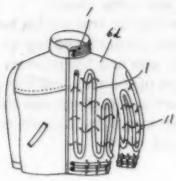
1. An athletic shoulder pad construction comprising:
a pair of outer shells each including a breast plate for covering the chest of the wearer, a back plate for covering the upper back and a curved bridge extending between said breast and back plates for covering the shoulder, said bridges being spaced above the shoulders and out of contact therewith;
a rigid arch underlying each shell, each arch having opposite end portions rigidly secured to the breast and back plates of the corresponding shell and curving between said opposite end portions to present an arch configuration which extends over the shoulder and which is separated from the shoulder and from the bridge of the corresponding shell by gaps, said arches being sufficiently rigid to hold said bridges of the shells off of and above the shoulders; and
a relatively soft pad underlying each arch and shaped to permit the breast and back plates of each shell to rest on the chest and back of the wearer with the rigidity of said arches preventing the bridges from applying forces to the shoulders when forces are applied to said shells, whereby forces applied to the shells are transmitted through said breast and back plates and said pads to the chest and back of the wearer without applying stress to the shoulders.

4,547,906

HEAT RETAINING ARTICLE

Takeshi Nishida, Ibaraki; Yousuke Yamagami, Hikone; Toshihide Takeda, and Toshio Saito, both of Nagahama, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,385
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—93 **17 Claims**



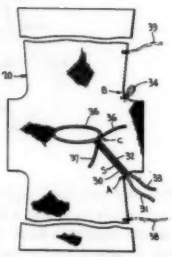
1. A heat retaining article comprising at least one inflatable envelope attached to a sheet material, said envelope being made of an air-impermeable sheet consisting of a cloth treated with at least one synthetic or natural rubber, said envelope containing a wadding material consisting of at least two polymers having different melting points, one of said polymers having been melted to partially weld said wadding, thereby substantially preventing said wadding from moving about within said envelope, the heat retaining property of said article being controlled by adjusting the amount of air in said envelope.

4,547,907

PATIENT'S GOWN

Margaret Netsky, 1405 Chickering Rd., Nashville, Tenn. 37215

Filed Mar. 21, 1983, Ser. No. 477,351
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—114 **10 Claims**



1. A light weight gown for use by a patient in a medical facility and which is comfortable to wear, easy to put on and take off, simple and inexpensive to make, and which allows for quick and easy access to the patient by medical personnel, said gown being openable along one side, said gown being made by the steps of

(1) providing a single pattern made from a single, homogeneous piece of textile fabric which is configured to include (a) an elongated main portion which has opposite ends that are generally straight and parallel and opposite side portions which converge to some extent towards one another as they extend inwardly from the ends of said main portion, said main portion being substantially symmetrical about both a transverse center line and a longitudinal center line passing therethrough, (b) first and second generally rectangularly shaped projection portions respectively extending away from the opposite sides of said main portion so as to be substantially symmetrical about said transverse center line, the point where one side of said first projection portion intersects with the associated side of said main portion being called intersection point A and the point where the opposite side of said first projection portion intersects with the associated side of said main portion being called intersection point B, (c) an opening at the center of said main portion, and (d) a slit extending from said opening to intersection point A, the point where said slit communicates with said opening being called intersection point C,

(2) attaching first and second closure ties to said textile fabric so as to respectively be connected to the opposite edges thereof which define said slit at intersection point A,

(3) attaching a closure loop to said textile fabric so as to extend away therefrom at intersection point B,

(4) attaching third and fourth closure loop ties to said textile fabric so as to respectively be connected to the opposite edges thereof which define said slit at intersection point C,

(5) folding said textile fabric about said transverse center line so as to provide a gown form having a front body part, a rear body part, right and left sleeve parts, a neck opening, a slit extending from the neck opening to a point at the underarm below one of said right and left sleeve parts, a closure loop attached to the side of the rear body part below said one sleeve part, and closure ties connecting the edges of the textile fabric defining the slit at the neck opening and at a point below said one sleeve part, as well as to connect said rear body part to said front body part at a point below said one sleeve part, and

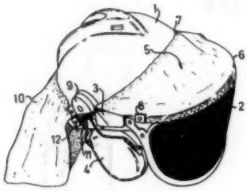
(6) connecting the side of said front body part to the associated side of said rear body part along their lengths below the second of said right and left sleeve parts of said gown form and the associated opposite sides of the projection portion which provides the second of said right and left sleeve parts so as to provide said gown.

4,547,908

CAP ARRANGEMENT

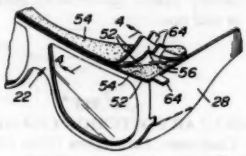
Peter Karlsson, Kyrkogatan 38 B, S-570 22 Forserum, and Leif Palmaer, Kristinagatan 14, S-331 00 Värnamo, both of Sweden

Filed Apr. 19, 1983, Ser. No. 486,373
Claims priority, application Sweden, May 3, 1982, 8202747
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—424 **4 Claims**



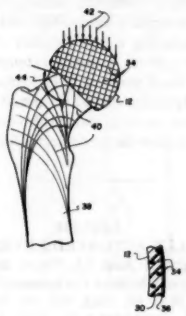
1. A cap arrangement suitable for sealing the space between a protective helmet and a visor pivotally mounted on said helmet, said visor having an upper edge and a lower edge, the cap arrangement consisting of a sheet of flexible material having a front edge for attachment to said upper edge of said visor, a rear edge for making sealing contact with the outer surface of such a helmet, attachment means for attaching said cap arrangement to respective opposite sides of the helmet, said attaching means including a flexible ribbon, means attaching said ribbon to said rear edge of the cap arrangement, and means for connecting ends of said ribbon which extends beyond the sheet of flexible material to respective opposite sides of said helmet.

4,547,909
EYE PROTECTION MEANS FOR EYE WEAR
Michael Bell, P.O. Box 400, Warrington, Pa. 18976
Filed Nov. 17, 1983, Ser. No. 552,999
Int. Cl.[4] A61F 9/02
U.S. Cl. 2—431 11 Claims



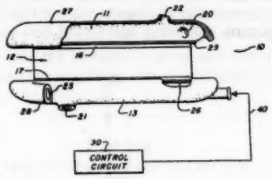
1. Eye protection means for use in combination with eye wear, said eye wear having at least one lens and a brow guard in the form of a surface extending laterally inwardly from the upper portion of the eye wear lens over to a position closely adjacent to the brow of the wearer, a dust retentive means in the form of a stack of plural layers of thin material secured to said brow guard, each of said layers having a tacky outer surface and being releasably secured to the underlying layer, whereupon said topmost layer traps dust particles thereon and when full said topmost layer is removed from the stack to expose the tacky surface of the underlying layer to permit said layer to trap air-borne dust particles thereon.

4,547,910
LOW FRICTION BEARING SURFACES AND STRUCTURES PARTICULARLY FOR ARTIFICIAL PROSTHETIC JOINTS
Jack Roberts, Farmington Hills, Mich., and Robert L. Johnson, Edina, Minn., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.
Division of Ser. No. 264,950, May 18, 1981,. This application Jan. 26, 1983, Ser. No. 460,997
Int. Cl.[4] A61F 1/00
U.S. Cl. 623—18 5 Claims



1. A method of making a wear resistant heat conducting slide bearing surface element comprising the steps of providing a mold, molding an epoxy resin into the shape of the element, gelling and post curing the epoxy resin, removing a surface portion of the cured epoxy resin, preparing a mixture of uncured epoxy resin with particles of aluminum oxide, coating the element with the mixture thereby replacing the surface portion that was removed, placing the element with the coating into the mold, gelling the coating and post curing the same to form a composite coating on the element.

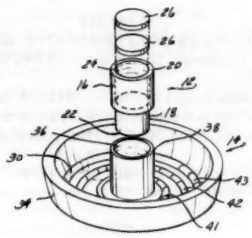
4,547,911
IMPLANTABLE HEART PUMP
Walter E. Strimling, 63 W. Cliff Rd., Weston, Mass. 02193
Filed Dec. 2, 1983, Ser. No. 557,592
Int. Cl.[4] A61F 1/24; A61M 1/03
U.S. Cl. 623—3 14 Claims



9. An improved artificial heart system including a pump for implantation into the human body, of the type having inlet and outlet conduits, and operative to execute an inlet or suction stroke, and an outlet or pumping stroke, such strokes together comprising a pump cycle, wherein the improvement comprises:

control means, in communication with the pump, for causing the pump to execute pump cycles at a frequency Nf which is a harmonic multiple N, where N is greater than one, of the normal hearbeat f.

4,547,912
AMPUTATION APPARATUS
Carole J. Sherva-Parker, 5117 Skylite Dr., Utica, Mich. 48087
Filed Sep. 1, 1983, Ser. No. 528,429
Int. Cl.[4] A61F 1/04, 1/06, 1/02
U.S. Cl. 623—16 15 Claims



1. An amputation apparatus for use with a prosthesis attachable externally to a stump having a bone, the amputation apparatus comprising:

a cap securable to the end of the bone in the stump, the cap having an open top, a bottom and side walls sized to fit externally over the end of the bone; and

a plate disposable completely internally within the stump and attachable to the cap, the plate extending radially outward a substantial distance beyond the outer periphery of the cap to define a large weight bearing surface at the end of the bone to evenly distribute forces over the entire end of the stump.

4,547,913
COMPOSITE PROSTHETIC FOOT AND LEG
Van L. Phillips, Salt Lake City, Utah, assignor to Flex Foot, Inc., Irvine, Calif.
Filed Jul. 11, 1983, Ser. No. 512,180
Int. Cl.[4] A61F 1/00, 3/00
U.S. Cl. 623—27 14 Claims

1. A prosthetic foot and leg comprising a composite structure formed from synthetic resin impregnated high strength

filament, said prosthetic foot and leg having as the primary structural elements thereof a foot portion and a heel portion aligned in a fore and aft direction, and a leg portion extending substantially vertically therefrom, said foot, heel and leg portions all being substantially rigidly joined to each other at the ankle region, said foot portion extending downward and forward of said ankle region so as to have substantial low energy absorption compliance in response to vertical loads thereon, said heel portion extending downward and rearward of said

ankle region, said heel portion also being flexible so as to have substantial low energy absorption compliance in response to vertical loads thereon, said leg portion having at least a part being substantially planar and extending substantially vertically with a cross section having a high area moment of inertia about an axis generally aligned with the fore and aft direction and a relatively low area moment of inertia about a horizontal axis perpendicular to the fore and aft direction, whereby said leg portion may elastically flex in a vertical fore and aft plane and not in a vertical transverse plane.

4,547,914

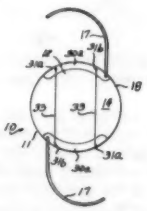
INTRAOCULAR POSTERIOR CHAMBER LENS

Lawrence D. Castleman, 1201 Water Cliff Dr., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 414,184, Sep. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 421,215, Sep. 22, 1982, Pat. No. 4,485,499. This application Oct. 31, 1983, Ser. No. 546,825

Int. Cl.⁴ A61F *1/16, 1/24*

U.S. Cl. 623—6 **14 Claims**



1. An intraocular lens for implantation in the posterior chamber of an eye after extracapsular extraction, comprising:

a lens body having a central optical region and a rear face,

means for fixating the lens body in operative alignment with the visual axis of the eye, and

chamber-roof profile defining means including rigid roof support members of predetermined dimension integral with the rear face at diametrically opposed points with respect to a selected portion of the optical region, the support members comprising a spaced pair of ridge means mutually joined by filament means and being adapted when the lens is fixated to contact the posterior capsule at support surfaces coinciding with the roof profile and to thereby provide a capsule-covered protected open zone overlying the rear face throughout the selected portion of the central optical region, the dimensions and spacing of the support members being such as to avoid blocking of the visual axis and sagging of the capsule into the open zone between the rear face and the thus supported capsule and to thereby enable non-invasive post-operative laser surgery in said open zone.

4,547,915

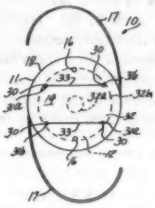
INTRAOCULAR POSTERIOR CHAMBER LENS

Lawrence D. Castleman, Farmington Hills, Mich., assignor to Margaret L. Roszkowski, Trenton, Mich.

Continuation of Ser. No. 421,215, Sep. 22, 1982, Pat. No. 4,485,499, which is a continuation-in-part of Ser. No. 414,184, Sep. 2, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,147

Int. Cl.⁴ A61F *1/16, 1/24*

U.S. Cl. 623—6 **1 Claim**



1. An intraocular lens for implantation in any eye having a capsule in the posterior chamber comprising:

A. a lens body having an optical region, a periphery, and a surface within said periphery;

B. means for fixating the lens body in operative alignment with the visual axis of the eye, said fixating means being attached to the lens body; and

C. means separate from the fixating means intended for contacting the capsule extending from said surface of said lens body including a first member extending from said lens body, a second member extending from said lens body; and a third member interconnecting said first and second members and spaced from said surface of said lens body, said first, second, and third members being located transversely within the periphery of the lens body.

4,547,916

MAGNETICALLY ACTUATED LEVEL INDICATOR

Arthur W. Henke, and John M. Antos, both of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

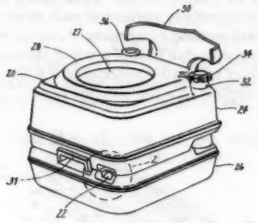
Filed Nov. 10, 1983, Ser. No. 551,659

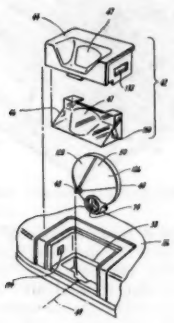
Int. Cl.⁴ E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—300 **21 Claims**

1. In a portable toilet having a tank for containing liquid material associated with use of the toilet, a level indicator comprising a visible indicator disposed in an open receptacle on the exterior of the tank, a float mechanism on the interior of the tank operable to sense the level of liquid material in the tank, a magnetic coupling between the float mechanism and the indicator for causing the indicator to be operated to a position corresponding to the level of liquid material sensed by the float mechanism within the tank and a bezel and lens assembly fitting over said indicator to close the receptacle, said bezel

and lens assembly providing a viewing window through which a portion of the indicator is visible, said indicator containing





indicia visible through the window to provide an indication of the level of liquid material in the tank.

4,547,917

WATER CLOSET SYSTEM HAVING A LIQUID SEPARATOR

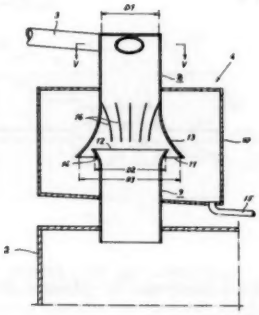
Torsten Akesson, Nypontunet 22, S-181 48 Lidingö , Sweden

Filed May 3, 1984, Ser. No. 606,759

Claims priority, application Sweden, May 11, 1983, 8302710

Int. Cl.⁴ E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—300 **7 Claims**



1. A water closet system comprising a lavatory, a collection tank or a mouldering chamber and a discharge pipe between said lavatory and tank or chamber, characterized in that said discharge pipe is sized in relation to the amount of liquid normally flowed therethrough so that said amount of liquid normally flowed therethrough is small in relation to the total capacity of said pipe whereby said normal amount of liquid flow through said pipe will tend to follow the inner wall of said pipe, a liquid separator means interconnected in said discharge pipe extending between the lavatory and collection tank or mouldering chamber and adapted to separate any liquid from the combined material received from the lavatory and comprising an inlet pipe provided below the lavatory and connected to the discharge pipe and an outlet pipe connected to said tank or mouldering chamber, the lower edge of said inlet pipe being widened, the upper edge of said outlet pipe being of at least the same cross section area as the non-widened portion of the inlet pipe, and the widened edge of said inlet pipe being of at least the same cross section area as said upper edge of the outlet pipe.

4,547,918

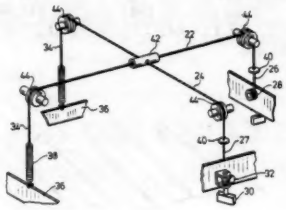
BODY SUPPORTING NETWORK

Frederick D. Ginpil, Toronto; Morris Milner, Willowdale, and John W. Senders, Toronto, all of Canada, assignors to Ontario Crippled Children's Centre, Toronto, Canada

Filed Aug. 16, 1983, Ser. No. 523,777

Int. Cl.⁴ A61G *7/00;* **A47C** *3/00*

U.S. Cl. 5—446 **20 Claims**



1. A body-supporting network suitable for use with a load supporting frame, said network comprising:

at least first and second pluralities of elongate support members each connected to said frame for supporting a load, the first and second support members respectively extending in first directions and second directions to provide potential load receiving intersections responsive to said load where the first support members cross the second support members;

adjustment means for controlling network pressure response at said load receiving intersections and for permitting changes in network contour of said first and second pluralities of elongate members; and

interconnecting means for connecting said elongate members at said intersections to maintain network integrity when the network is subjected to said load.

4,547,919

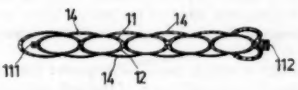
INFLATABLE ARTICLE WITH REFORMING AND REINFORCING STRUCTURE

Cheng-Chung Wang, 7th Fl., No. 37, An-Ho Rd., Taipei, Taiwan

Filed Feb. 17, 1983, Ser. No. 467,546

Int. Cl.⁴ A47C *27/08;* **A41D** *13/10;* **F41H** *1/04*

U.S. Cl. 5—455 **2 Claims**



1. Inflatable article having at least one gas impervious first sheet formed into an inflatable envelope having opposed sides and which is provided with heat sealed edges and parallel

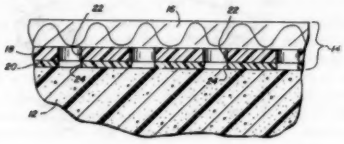
spaced apart first longitudinal heat seal seams to form juxtaposed and structurally fixedly interconnected first elongate air compartments, and a second gas impervious one piece overlay sheet heat sealed to one side of said inflatable envelope along second longitudinal seams which lie parallel with and correspondingly between each adjacent two of said first seams to form second elongate air compartments juxtaposed and structurally fixedly interconnected with each other and correspondingly structurally fixedly interconnected with the adjacent said first compartments along said second seams, said second sheet having one continuous seal free portion thereof folded and extending over at least one said heat sealed edge and heat sealed to the other side of said inflatable envelope along corresponding third longitudinal seams opposite to said second seams.

4,547,920

PROCESS FOR DEVELOPING POROSITY IN AIR IMPERVIOUS FILM AND ARTICLES PRODUCED BY THE PROCESS

William H. Hulsebusch, Dewitt, and Lysle R. Hinkhouse, Wilton, both of Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa

Filed Oct. 19, 1983, Ser. No. 543,500
Int. Cl.[4] A47C *27/14*; B29D *27/04*
U.S. Cl. 5—468 **16 Claims**



1. A molded seat cushion or the like which has a cover provided with air flow capabilities, comprising:

a foam body molded in the shape of a desired seat cushion;

and a covering for the foam body including an outer fabric layer and an inner laminated film; the film including a first layer which is air impervious with the exception of perforations therein, and a second air impervious layer having air passages coincident with the perforations of the first layer, the air passages in the second layer having been formed by melting selected portions of the second layer.

4,547,921

PATTERN DYEING OF TEXTILE MATERIALS SUCH AS CARPET

Billy J. Otting, and Alfred Clifford, both of LaFayette, Ga., assignors to Otting Machine Company, Incorporated, LaFayette, Ga.

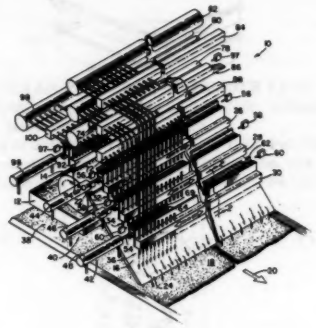
Continuation of Ser. No. 156,624, Jun. 5, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 387,291
Int. Cl.[4] D06B *1/06*
U.S. Cl. 8—151 **21 Claims**

3. For retrofit combination with a carpet dyeing machine for dyeing a continuously moving carpet web driven continuously along a horizontal path including a rotating roller supplied with base color dye liquid from a trough, an inclined flat blade for scraping dye from the roller to cause a film of base color dye to flow uniformly downwardly over the doctor blade to fall from the ower edge of the doctor blade onto the carpet web conveyed therebelow, pattern dyeing apparatus comprising:

a plurality of nozzle bars spaced above the roller and blade in the direction of travel of the web and extending across the width of the carpet web, each bar carrying a plurality of delivery tubes having spaced outlet ends and disposed in a row positioned above and directed towards the doctor blade for adding dye or chemical of at least one additional color or other characteristic to the base color dye film on the roller and in selected areas of the doctor blade so as to cause a mixing thereof on said flat blade before the dye falls from the lower edge.

4. A method of dyeing carpet while being continuously driven along a substantially horizontal path so as to form patterns thereon, said method comprising the steps of:

forming a base color dye film of a width substantially equal to the width of the textile material on a roller from which said dye is applied to a flat inclined plate;



controllably discharging liquid streams of additional dye color or chemical onto the previously formed base color dye film on the roller and the inclined plate in selected areas of the inclined plate so as to mix the dye film with the additional dye color or chemical while they are on the inclined plate, and

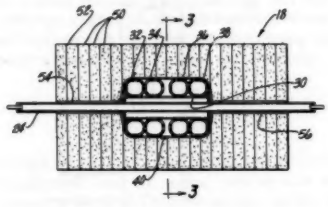
depositing the base color dye and the additional dye or chemical onto the carpet by allowing liquid to fall by gravity from the lower edge of the inclined plate onto the carpet.

4,547,922

TOP BRUSH CONSTRUCTION WITH INFLATABLE CENTER SECTION

David J. Bivens, Danville, Va., assignor to Bivens Winchester Corporation, Danville, Va.

Filed Jan. 19, 1984, Ser. No. 572,116
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—97 B **9 Claims**



1. A rotary brush like device for vehicle washing systems comprising:

a support shaft having a given length;

radially resilient cushion means mounted centrally of such shaft but of lesser length than said shaft;

a first plurality of radially extending scrubber elements mounted on and over said radially resilient means;

second and third plurality of radially extending scrubber elements mounted on and over the end segments of said support shaft which are outboard of but contiguous with said resilient means;

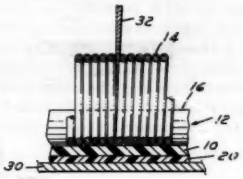
the first second and third pluralities of scrubber elements being of such effective radial length as to produce a uniform overall outer diameter of said brush like device over the entire length thereof.

4,547,923

SURGICAL KNIFE CLEANER

James H. DeVries, Grand Rapids, Mich., and John H. Dufek, Birmingham, Ala., assignors to DLP Inc., Grand Rapids, Mich.

Filed Mar. 15, 1984, Ser. No. 591,397
Int. Cl.⁴ A47L *25/00*
U.S. Cl. 15—104 R **5 Claims**



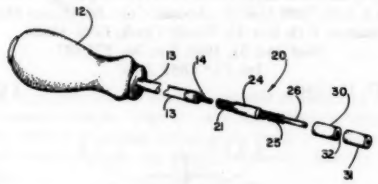
1. A disposable cleaner for a surgical knife which comprises
a support base,
a cradle affixed to and extending along said support base, said cradle having an arcuate cross section with free top edges spaced from said support base,
a closely wound coil having a central axis,
means fastening said coil within said cradle, said coil and cradle being dimensioned such that said cradle embraces the lower portion of said coil along its length and such that said cradle and said free top edges simultaneously function to limit insertion of a surgical knife into said coil and to limit lateral motion of said coil relative to said support base, and
means for removably securing said support base to a surgical operating area.

4,547,924

GUN CLEANING IMPLEMENT

Sanford L. Brygider, 1775-C Wilwat Dr., Norcross, Ga. 30093

Filed Jul. 5, 1983, Ser. No. 510,667
Int. Cl.⁴ F41C *31/02*
U.S. Cl. 15—104.16 **4 Claims**



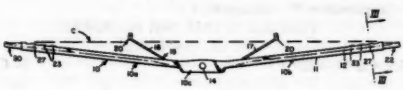
1. A gun cleaning implement comprising:
a cylindrical cleaning tip, said cleaning tip comprising an end section operative for threaded attachment to a conventional gun cleaning rod, an intermediate section having a circumferential surface, a first section remote from said end section and of reduced diameter relative to said intermediate section and formed having a threaded surface, and a second section yet further remote from said end section and of reduced diameter relative to said first remote section; and
cleaning means secured about said first section and said second section, said cleaning means including a first cylindrical cleaning swab having an internal passageway about its longitudinal axis, said passageway an internal diameter slightly smaller than that of said first section remote of said end section whereby said first swab is threadably fitted on the first section so as to prevent removal of said cleaning swab from said cleaning tip,
and a second cylindrical cleaning swab having an internal passageway about its longitudinal axis, said passageway having an internal diameter slightly larger relative to that of said second section remote from said end section whereby said second swab freely fits about said second section and is slidably removable therefrom by withdrawing the cleaning tip from the barrel of a gun.

4,547,925

CARRIER FOR A WINDSCREEN WIPER BLADE

Malcolm H. Blackborow, 10 Clarence Rd. North, South Benfleet, Essex, and Marlyn Langley, 58 Barncroft Close, Loughton, Essex, both of England

PCT No. PCT/GB81/00181, § 371 Date May 11, 1982, § 102(e) Date May 11, 1982, PCT Pub. No. WO82/00982, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 7, 1981, Ser. No. 380,740
Claims priority, application United Kingdom, Sep. 12, 1980, 8029643; Oct. 6, 1980, 8032071; Jan. 19, 1981, 8101500
Int. Cl.⁴ B60S *1/04*
U.S. Cl. 15—250.42 **14 Claims**



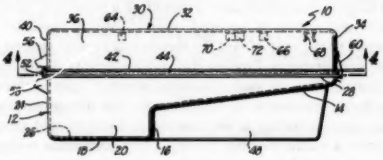
1. A windscreen wiper blade carrier comprising a bowed main stem including a central portion for engaging a wiper arm and first and second end portions, a first extension arm telescopicly received by said first end portion and a second extension arm telescopicly received by said second end portion, said first and second extension arms being independent of each other and including first and second socket means, respectively, for attachment to a wiper blade, whereby said wiper blade may be engaged only at selected locations between its ends and remain substantially free of contact therebetween, and wherein the distance between said first and second socket means comprises a chord length which can be adjusted by telescopicly adjusting said first and second extension arms with respect to said first and second end portions of said bowed main stem and said wiper blade carrier can thereby accept wiper blades having a plurality of different lengths.

4,547,926

ROLLER TRAY WITH COVER

Gilbert G. Kern, 515 N. Victory Blvd., Burbank, Calif. 91502

Filed Dec. 5, 1983, Ser. No. 558,374
Int. Cl.⁴ B44D *3/12*
U.S. Cl. 15—257.06 **8 Claims**



1. A roller tray with cover;
said roller tray having a bottom and having sides to form an

upwardly open but otherwise closed container having an upper upwardly directed peripheral surface, said roller tray being molded as one piece of synthetic polymer composition material;

said cover having a flat top and having downwardly directed side walls having a downwardly directed surface so that said cover is closed except for its downwardly facing opening between said side walls, said side walls being positioned so that its downwardly directed surface faces the upwardly directed peripheral surface of said sides of said tray, said cover being molded as one piece of synthetic polymer composition material, said cover being hingedly mounted on said tray, a stop molded into at least one of said roller tray and cover to limit the angular hinge opening of said cover with respect to said roller tray; and

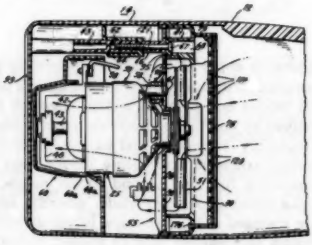
a resilient seal between said surface on said tray and on said cover so that said flat-topped cover can be hingedly raised with respect to said tray to selectively provide access to said tray and selectively hinged down to cover, enclose and seal said tray to inhibit drying of material within said tray.

4,547,927

COMPACT VACUUM CLEANER

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Dec. 8, 1983, Ser. No. 559,335
Int. Cl.[4] A47L *9/22*
U.S. Cl. 15—327 F **14 Claims**



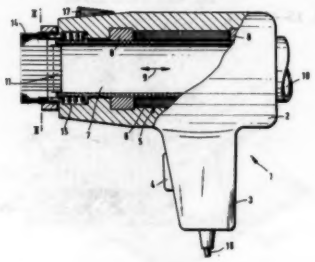
1. A vacuum cleaner including a casing comprising a tank section for storing dirt picked up by said vacuum cleaner, and a housing section to the rear of said tank section; a fan means within said casing; a motor disposed within said housing section and having an output shaft drivingly connected to said fan means to create a main air stream that flows through said casing by drawing air into said tank section through an inlet at the front thereof and exhausting air through an outlet at the rear of said housing; said shaft extending in a front to rear direction and said main air stream moving longitudinally of said shaft to cool said motor; first means defining a chamber in front of said motor and within which said fan means is rotatably disposed; said first means including a mounting member to which said motor is secured; said mounting member being disposed to the rear of said fan means and closely spaced therefrom; said airstream flowing through a plurality of apertures in surface portions of said mounting member; said surface portions being transverse to said front to rear direction; said first means also including a fan housing in front of said mounting member; a baffle member having a cup formation into which the rear of said motor extends; a common fastening means mechanically securing said mounting member, said fan housing and said baffle said motor housing, member together as a unitary structure.

4,547,928

TOOL FOR CLEANING AND REMOVING DEPOSITED MATERIAL, PARTICULARLY FROM MOTOR VEHICLE BRAKE DRUMS

Horst Ludscheidt, Westfälische Str. 171, 4600 Dortmund 12, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,096
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239150
Int. Cl.[4] A47L *5/00*
U.S. Cl. 15—364 **15 Claims**



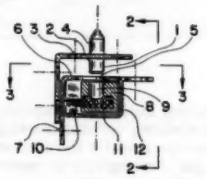
1. A tool for removing solid material deposits on surfaces to be cleaned, particularly for cleaning material from brake drums of motor vehicles and for removing the material, comprising means for loosening and cleaning the deposited solid material and means for removing the loosened material from the cleaned surface, said cleaning means comprises a manually operable cutting head including an impact element arranged to effect a stroke-like movement, and said removing means comprising a connection on said cutting head for placement in communication with a vacuum source, said cutting head includes an axially extending tubular member having a first end and a second end with said impact element located at the first end thereof, said tubular member arranged to perform the stroke-like movement and to transmit such movement to said impact element, means for forming a seal laterally enclosing said impact element, and said connection located at the second end of said tubular member so that the loosened material is removed through said tubular member from the laterally sealed space at the first end of said tubular member.

4,547,929

SPRING BIASED SHIFTING PIVOTING CENTER HINGE

Hyok S. Lew, 7850 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Filed Jan. 31, 1984, Ser. No. 575,587
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—286 **1 Claim**



1. A spring biased shifting pivoting center hinge comprising: a hinge pin rigidly affixed to an angled piece of sheet metal, said piece of sheet metal having a first fastening means, said first fastening means comprising a plurality of counter sunk screw holes, said hinge pin extending through and engaging a

hole disposed in said angled piece of sheet metal so as to be located on both sides of said sheet metal, said hinge pin being welded to the angled piece of sheet metal, a one piece sheet metal enclosure including a second fastening means, said second fastening means comprising a plurality of counter sunk holes, said sheet metal enclosure having a substantially triangular shaped slotted hole disposed through a top wall of said sheet metal enclosure, a sliding block having a vertically oriented circular hole and a horizontal oriented hole and being slidably disposed beneath the top wall of the sheet metal enclosure in directions substantially parallel to one center line of said substantially triangular hole, said circular hole rotatably receiving said hinge pin that extends through and engages said substantially triangular hole, a coil spring resiliently retaining said sliding member at one extremity of its sliding position wherein said hinge pin is substantially located at one corner of said substantially triangular hole, said coil spring being received in and engaging at one end the horizontally oriented hole in said sliding block and engaging at another end the sheet metal enclosure, said sliding block being slidably confined on all sides by bent sections of said one piece sheet metal enclosure.

4,547,930

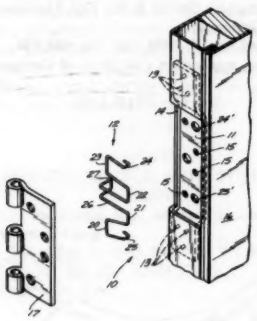
HINGE PREPARATION ASSEMBLY FOR A STEEL DOOR

Donald L. King, Loveland; Robert O. Ruff, and Ernest D. Schwarz, II, both of Cincinnati, all of Ohio, assignors to American Standard Inc., New York, N.Y.

Filed Apr. 19, 1984, Ser. No. 602,028

Int. Cl.⁴ E05D *5/00*

U.S. Cl. 16—382 **12 Claims**



1. A hinge preparation assembly capable of mounting a leaf of a standard weight hinge set or a heavy weight hinge set thereto without requiring changing the depth of a cutout section of a steel member, said hinge preparation assembly comprising:

a hinge reinforcement member mounted to said each hinge cutout section of the steel member, whose depth is equal to the thickness of a heavy weight hinge leaf, said hinge reinforcement member having a plurality of spaced apart openings, including spaced apart threaded openings corresponding to the openings of said hinge leaf and a;

said hinge conversion means, shaped in the form of a unitary member, and having latch means, said latch means being coupled to at least one of said plurality of spaced apart openings in said reinforcement member; and

said unitary member having a thickness which is substantially equal to the difference between that of the standard weight hinge leaf and the heavy weight hinge leaf.

4,547,931

APPARATUS FOR AUTOMATIC DELIVERY FROM A RECEIVER OF ADJACENTLY HANGING LOOPS OF SAUSAGES

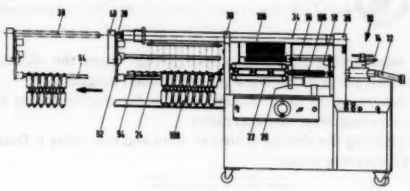
Georg Staudenrausch, Biberach; Franz Abt, Schemmerhofen; Manfred Kern, Ummendorf, and Georg Zinser, Winterstettenstadt, all of Fed. Rep. of Germany, assignors to Albert Handtmann Maschinenfabrik GmbH & Co., KG, Biberach, Fed. Rep. of Germany

Filed Oct. 4, 1983, Ser. No. 538,782

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3238023

Int. Cl.⁴ A22C *15/00*

U.S. Cl. 17—1 F **9 Claims**



1. Apparatus comprising a horizontally elongated receiver having a rear end portion onto which connected, lengthwise adjacent sausages are fed as they are produced, to be supported by the receiver as loops which hang across it and are spaced at intervals along its length, receiver drive means for propelling loops of sausages on the receiver forwardly along the same towards a front end thereof, and means for transferring loops of sausages from the receiver onto a smoking rod upon which the sausages can be carried away from the receiver and by which they can be supported for smoking, wherein the last mentioned means comprises:

A. a smoking rod carrier having a socket in which a front end portion of a smoking rod is readily removably receivable;

B. means mounting said smoking rod carrier for translatory rearward movement to and forward movement away from a home position in which

(1) said smoking rod carrier is forwardly adjacent to the front end of the receiver and

(2) a smoking rod in said socket extends rearwardly therefrom substantially parallel to the length of the receiver, vertically beneath the receiver and near the same; and

C. carrier drive means for moving said smoking rod carrier forward from its said home position in synchronism with forward motion of said receiver drive means, so that loops of sausages dropping off of the front end of the receiver and onto a smoking rod in said socket are disposed at regular intervals along that smoking rod.

4,547,932

PROCESS AND APPARATUS FOR SHIRRING TUBULAR CASINGS

Arno Romeike, Taunusstein; Richard Regner, Mainz-Bretzenheim, and Alois Weinheimer, Alzey, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 621,186

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322105

Int. Cl.⁴ A22C *13/02*

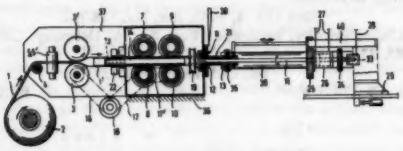
U.S. Cl. 17—45 **18 Claims**

1. A process for shirring tubular casings, comprising the steps of:

(a) transporting the casing in the direction of its longitudinal axis;

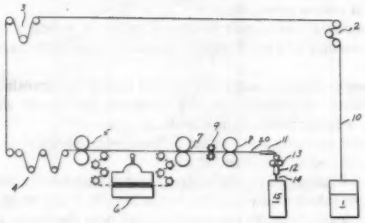
(b) forming folds in the casing at a shirring area by means of a shirring tool:

(c) providing continuous non-positive internal support for the casing at least in the shirring area;
(d) causing the shirred tubing portion to rotate about its longitudinal axis during the action of the shirring force, by rotating the internal support;
(e) simultaneously compressing the shirred tubing against a receding counterforce;



(f) interrupting transport of the casing when the shirred tubing portion reaches a predetermined length;
(g) removing the internal support from the shirred tubing in a severing area; and thereafter
(h) severing the shirred tubing portion and removing it from the severing region.

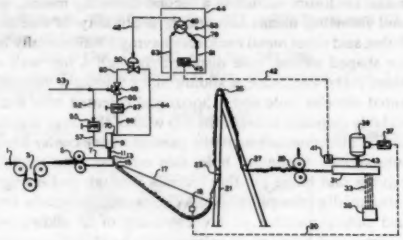
4,547,933
PROCESS FOR PREPARING A HIGH STRENGTH ARAMID SPUN YARN
Herbert G. Lauterbach, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 389,622, Jun. 18, 1982, Pat. No. 4,477,526.
This application Aug. 17, 1984, Ser. No. 641,783
Int. Cl.[4] D01G *1/08*
U.S. Cl. 19—0.35 **4 Claims**



1. Process for preparing a sliver of stretch broken high strength, high modulus p-aramid fibers by feeding a yarn or tow of continuous p-aramid filaments having a filament tenacity of at least 18 gpd and a filament modulus of at least 400 gpd under low tension into a tensioning zone, tensioning the filaments almost to their breaking tension, randomly breaking the tensioned filaments by sharply deflecting them laterally with interdigitating mechanical deflectors, removing the resulting sliver from the tensioning zone and optionally crimping the filaments.

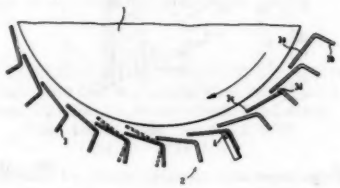
4,547,934
CRIMPED STAPLE FIBER
Thomas J. Ford, Spartanburg, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 31, 1984, Ser. No. 575,630
Int. Cl.[4] D01G *1/04*; D02G *1/12*
U.S. Cl. 19—0.56 **20 Claims**

1. A process for producing crimped staple fibers with uniform cohesion level which comprises:
(a) forcing uncrimped continuous filament tow into a crimping chamber equipped with an adjustable discharge regulation means,
(b) feeding the crimped continuous filament tow produced by (a) through a staple cutter,



(c) automatically adjusting the discharge regulation means in response to the speed of the staple cutter.

4,547,935
WASTE GRID FOR A TEXTILE FIBER PROCESSING MACHINE
Peter Jagst, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany
Filed Sep. 4, 1984, Ser. No. 646,934
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333618
Int. Cl.[4] D01B *1/44*
U.S. Cl. 19—93 **8 Claims**



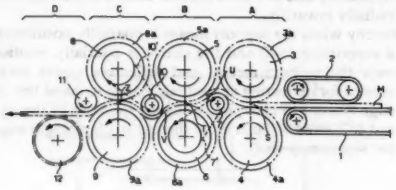
1. In a textile fiber processing machine including a rotary cylinder having circumferential areas for engaging and circumferentially entraining fiber material introduced into the machine; a waste grid situated adjacent to and radially spaced from, a circumferential portion of the cylinder; said waste grid allowing waste from the fiber material to pass through; the improvement in said waste grid comprising a plurality of grid bars supported parallel to one another; adjoining grid bars defining grid slots through which waste may pass; each grid bar having a bar face oriented towards said cylinder and a free end portion; said bar faces being inclined towards said cylinder for abutting fiber material thrown towards said waste grid by said cylinder and for allowing waste material, after impingement thereon, to slide on said bar face towards and off said free end portion.

4,547,936

DRAWING APPARATUS FOR TEXTILE FIBRE WEBS

Giovanni Bacchio, Mongrando, Italy, assignor to Fonderie Officine Riunite Ing. Graziano di L. Graziano & C.S.a.s., Italy

Filed May 24, 1984, Ser. No. 613,487
Claims priority, application Italy, May 24, 1983, 67575 A/83; Jan. 23, 1984, 67064 A/84
Int. Cl.[4] D01H 5/24
U.S. Cl. 19—258 10 Claims



1. Drawing apparatus for multi-layer textile fiber webs, said apparatus comprising

a plurality of roll pairs,

said roll pairs adapted to be driven so that the peripheral velocity of the rolls of each said pair is greater than the peripheral velocity of the preceding pair in the direction of advance of said web,

resilient coverings provided around the rolls of each said pair, said coverings being constituted by highly flexible steel wires which extend substantially radially, and,

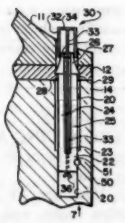
a respective smooth roller positioned between each roll pair and the following roll pair, each said smooth roller being of a smaller diameter than the rolls of said roll pairs and drive means operatively connecting each said smooth roller to an adjacent roller for driving each said smooth roller at a peripheral velocity equal to that of the associated said following roll pair, the arrangement of said smooth rollers being such as to impart a sinuous path to said web and to maintain the web in contact with the roll coverings over substantial arcs.

4,547,937

SNAP LOCK CONNECTOR WITH PUSH-BUTTON RELEASE

Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Portland, Oreg.

Filed Sep. 6, 1983, Ser. No. 529,501
Int. Cl.[4] A44B 17/00
U.S. Cl. 24—607 5 Claims



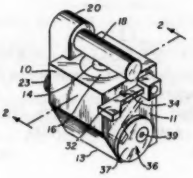
1. A snap-lock fastener for releasably joining together first and second articles, said snap-lock fastener comprising a locking mechanism and a push-button release mechanism, means connecting the locking mechanism and the push-button release mechanism together, means supporting the locking mechanism and push-button release mechanism in extended relation to said first article, the second article having an opening registrable with the locking mechanism and push-button release mechanism, interengaging means within said opening and on said locking mechanism normally connecting the two articles, said interengaging means being responsive to relative movement of the push-button release mechanism and the locking mechanism to disengage the interengaging means and separate the two articles, and said locking mechanism comprising a tubular sleeve, a split frusto-conical end portion at one end of the sleeve, means connecting the other end of the sleeve to said first article with the frusto-conical end of the sleeve projecting beyond said first article and a shoulder projecting in right angular relation to the opening in said second article at its juncture with the frusto-conical end portion comprising the interengaging means with the second article, said push button release mechanism engaging the frusto-conical end portion to substantially close the said split end portion whereby the shoulder disengages the second article.

4,547,938

YARN TEXTURING JET

Robert E. Cullen, Kennett Square; Henry B. Kurowski, Chadds Ford, both of Pa., and William S. Sidwell, Port Penn, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1984, Ser. No. 668,440
Int. Cl.[4] D02G 1/16
U.S. Cl. 28—254 2 Claims

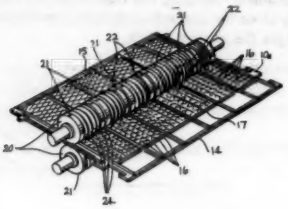


1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore, a venturi located in said bore at said outlet end, said venturi having a collar attached thereto, said collar having a circumferential groove and being axially slidable in said body from a preset operating position to a string up position back to a preset operating position, a yarn guiding element extending into said bore from the yarn inlet end of the body, said yarn guiding element having a passage therethrough for guiding yarn from the yarn inlet to the venturi and a cylindrical baffle attached to a bracket located adjacent the outlet end of the jet, the improvement comprising: a rod rotatably mounted in the body, said rod having a cam surface intermediate its ends, said cam surface engaging said groove; a handle attached to one end of the rod and movable adjacent to a surface of said body; and first and second stops located on said surface between which said handle is rotated to string up and operating positions, respectively, said second stop being adjustable to provide a range of settings for the operating position.

4,547,939
SECONDARY BATTERIES

William L. McDowall, 38 Belinda Ct., Glen Waverley, Victoria, and Alan K. Maplesden, 3/60 Peel St., Kew, Victoria, both of Australia

PCT No. PCT/AU81/00187, § 371 Date Aug. 9, 1982, § 102(e) Date Aug. 9, 1982, PCT Pub. No. WO82/02118, PCT Pub. Date Jun. 24, 1982
Division of Ser. No. 414,359, Aug. 9, 1982, abandoned. This PCT application Dec. 8, 1981, Ser. No. 599,222
Claims priority, application Australia, Dec. 9, 1980, PE 6844
Int. Cl.[4] B23P *13/00*
U.S. Cl. 29—2 4 Claims

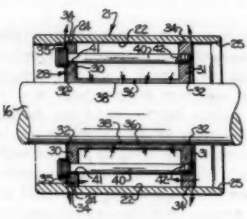


1. A method of manufacturing a battery grid having a plurality of side by side rectangular paste receiving areas each having a metal mesh element supported therein, said method comprising moulding a plastic rectangular perimeter frame with a plurality of integral division elements located parallel to opposite sides of the perimeter frame to define between said opposite sides said side by side rectangular paste receiving areas, embedding during moulding of the frame at least a portion of the mesh element in one of said opposite sides of the frame and in at least one adjacent division element so the mesh element spans the paste receiving area, and thereafter forming in the exposed portion of each mesh element at least one corrugation extending parallel to the division elements so that the mesh element is stretched to remove any buckling thereof occurring during moulding of the frame thereabout.

4,547,940
TRANSPORT ROLLER ASSEMBLY

Dieter H. Bluhm, Charlotte, N.C., assignor to American Barmag Corporation, Charlotte, N.C.

Filed Jun. 22, 1983, Ser. No. 506,621
Int. Cl.[4] B21B *31/00*
U.S. Cl. 29—113 R 9 Claims



1. A transport roller assembly adapted to be releaseably fixed on a supporting shaft, and which is adapted for use as a yarn delivery roller in a false twisting machine or the like, and comprising

a cylindrical sleeve having a coaxial central bore,

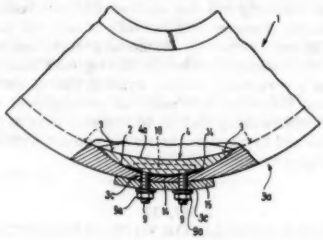
support means for releaseably fixing said sleeve coaxially on a supporting shaft, and including a pair of axially spaced apart flange means, at least one of said flange means comprising a relatively thin annular flange having a central opening defining an inner edge which is adapted to be closely received on the supporting shaft and an outer edge adapted to be closely received in the bore of said sleeve, wall means disposed axially between and contacting said pair of flange means for maintaining the adjacent portions of said flange means at a fixed axial separation, and manually movable deflecting means operatively engaging said pair of flange means for deflecting at least said flange of said flange means into a slightly conical configuration and so that at least a portion of said outer edge moves radially outwardly and at least a portion of said inner edge moves radially inwardly,

whereby when the support means is coaxially positioned on a supporting shaft and the sleeve is coaxially positioned over the support means, said deflecting means may be moved for deflecting at least said flange to cause the outer edge thereof to clampingly engage the bore of the sleeve and to cause the inner edge thereof to clampingly engage the supporting shaft.

4,547,941
METHOD FOR REPAIRING HOUSINGS OF PUMPS AND THE LIKE

Gudrun Meier, Karlsruhe, Fed. Rep. of Germany, assignor to Soudbrase-Schweisstechnik GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,745
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209917
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R 17 Claims



1. A method of repairing a housing, particularly the housing of a pump for conveying sand, gravel or the like, which has developed a recess as a result of wear, erosion, washout, cavitation and/or similar influences, comprising the steps of making a pattern which fits into and at least substantially fills the recess; utilizing the pattern to form an impression thereof in a mold; pouring into the impression a hardenable molten substance to thus produce a casting which is a replica of the pattern; inserting the casting into the recess; and fastening the inserted casting to the housing.

4,547,942
METHOD FOR PRODUCING A MUFFLER

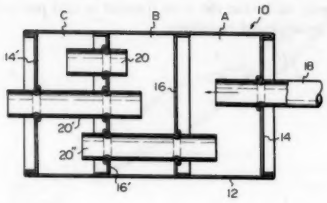
Masuo Fukuda, Toda, Japan, assignor to Saikei Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,439
Claims priority, application Japan, Apr. 23, 1982, 57-69400
Int. Cl.[4] B21D *53/00, 53/88*
U.S. Cl. 29—157 R 11 Claims

1. A method of rigidly connecting at least one plate and at least one tube to each other, comprising the steps of:

(a) forming an eyelet through the plate such that a flange is produced which has an inside diameter substantially equal to the outside diameter of the tube, and has a portion substantially thick in the direction of the longitudinal axis of the tube;

(b) inserting the tube into said eyelet and fixing the tube in a predetermined position relative to the plate;
(c) preparing stop means for fixing the plate in position in contact with a flat surface of the plate where the flange is absent, and die means for folding the flange in cooperation with said stop means when driven along the longitudinal axis of the tube, said stop and die means each being formed with a recess having an inside diameter which is substantially equal to the outside diameter of the tube for receiving the tube therein, the recess of said die means being formed with an additional recess for receiving a portion of



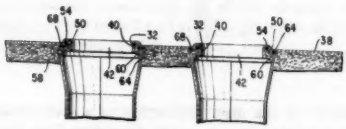
the flange therein, the recess of said stop means being formed with an additional recess for receiving a folded portion of the flange therein;
(d) positioning the stop and die means relative to the tube so that said recesses receive the tube therein to bring the stop and die means into abutment with the flat surface of the plate and the distal end of the flange, respectively; and
(e) driving at least one of the stop and die means relatively to each other in the directions of the longitudinal axis of the tube until the portions of the flange received by the additional recesses are folded to thrust into the outer periphery of the tube.

4,547,943

METHOD OF MANUFACTURING A HEAT EXCHANGER AND PLATE ASSEMBLY

Russell W. Hoeffken, Belleville, Ill., assignor to Snyder General Corporation, Red Bud, Ill.

Division of Ser. No. 178,337, Aug. 15, 1980, abandoned. This application Dec. 11, 1981, Ser. No. 329,778
Int. Cl.[4] B23P *15/26;* **B21D** *39/06;* **F24H** *9/14*
U.S. Cl. 29—157.3 R **10 Claims**



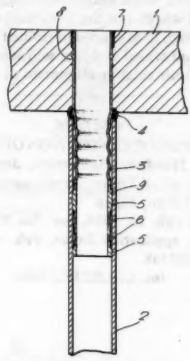
3. A method of joining a heat exchanger for a furnace to a partition plate member comprising the steps of:
providing said heat exchanger in the form of a pair of opposed sheet metal clamshell sections joined together along cooperating edges to form a closed combustion chamber having at least one opening intersecting said edges and a wall extending generally radially outwardly from said one opening around the periphery of said one opening;
providing a partition plate comprising a generally planar member having an opening formed therein corresponding to said one opening and defined by a continuous seamless circumferential flange projecting from a surface of said plate;
inserting said flange through said one opening toward said chamber from the exterior of said heat exchanger; and
expanding the peripheral edge of said flange radially outwardly relative to said openings to force said flange into engagement with said wall and without materially deforming said wall to form a rigid leakproof joint between said heat exchanger and said plate.

4,547,944

TUBE-IN-SHELL HEAT EXCHANGERS

Owen Hayden, Bolton, England, assignor to National Nuclear Corporation Limited, London, England

Filed Mar. 2, 1984, Ser. No. 585,450
Int. Cl.[4] B23P *15/26, 7/00*
U.S. Cl. 29—402.09 **19 Claims**



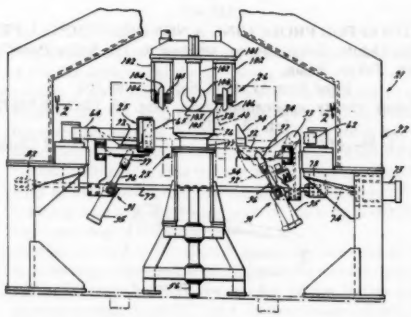
1. A method of repairing a defective tube in a tube sheet of a tube-in-shell heat exchanger, which method comprises inserting within the defective tube a tubular sleeve, and sealingly bonding spaced end regions of the sleeve to the tube sheet and the tube to bridge the defect, wherein, the improvement comprises an unbonded portion of the tubular sleeve defining a plurality of circumferential corrugations lying between the bonded end regions so as to possess axial flexibility.

4,547,945

TIRE AND WHEEL ALIGNMENT SYSTEM

Lawrence J. Lawson, Troy, Mich., assignor to Dominion Tool & Die Company, Inc., Roseville, Mich.

Continuation of Ser. No. 327,720, Dec. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 293,291, Aug., 1981, abandoned. This application Oct. 29, 1984, Ser. No. 665,493
Int. Cl.[4] B23Q *17/00;* **B23P** *19/00*
U.S. Cl. 29—407 **22 Claims**



1. A mechanism for aligning a mounted tire on a wheel in a single station comprising:
rotating means for rotating at least one of said wheel and tire mounted thereon within said single station;

holding means actuable for holding one of said wheel and tire against rotation within said single station; and

sensing means within said single station for sensing a predetermined angular location of one of said wheel and tire, said sensing means being operative to actuate said holding means to prevent rotation of said one of said wheel and tire while the other of said wheel and tire may be rotated, said one of said wheel and tire being thus held by said holding means in a predetermined angular location, said sensing means also being operative to sense an angular position of the other of said wheel and tire and to halt rotation thereof when said sensed angular position of said other of said wheel and tire is located in a predetermined location relative to said predetermined angular location of said one of said wheel and tire, said sensing means thereby assuring accurate relative alignment of said wheel and tire.

4,547,946

METHOD FOR PRODUCING A NONDIRECTIONAL PEN

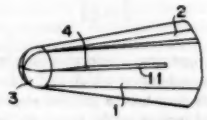
Kazuhiko Osaki; Hirofumi Hamamoto; Junzi Kurokawa, znd Shigeru Akieda, all of Tokyo, Japan, assignors to The Sailor Pen Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,650

Claims priority, application Japan, Feb. 28, 1983, 58-30751; Nov. 9, 1983, 58-209168

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—412 **7 Claims**



2. A method for producing a nondirectional pen, comprising the steps of drawing a metal pipe to form a pen blank having three or more radial blade sections extending along the length of said pen blank and equally spaced angularly away from one another, each of said radial blade sections including an internal gap extending along the length of that blade section; cutting said pen blank into pen bodies having a predetermined length; shaping the forward end of each of said pen bodies into a substantially conical configuration while at the same time forming the tip of said pen body into a semi-spherical shape to provide a pen point; slotting said pen body from its tip to form longitudinal slots each aligning with the internal gap of the corresponding blade section; and hardening the semi-curcular tip of said pen body.

4,547,947

METHOD FOR PRODUCING A NONDIRECTIONAL PEN

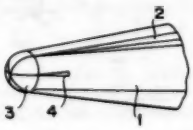
Katuzi Oshita, Tokyo, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,801

Claims priority, application Japan, Mar. 29, 1983, 58-51672

Int. Cl.⁴ B23P *17/00*

U.S. Cl. 29—412 **2 Claims**



1. A method for producing a nondirectional pen, comprising the steps of drawing a solid metal rod to form a pen blank having three or more radial blade sections extending along the length of said pen blank and equally spaced angularly away from one another; cutting said pen blank into pen bodies having a predetermined length; shaping the forward end of each of said pen bodies into a substantially conical configuration; welding a pen-point ball to the tip of said pen body; slotting said pen body from its tip to a predetermined depth through said pen point ball to form longitudinal slots each extending from a V-shaped groove defined between each adjacent blade sections to a depth in the corresponding blade section; holding said pen body in such a state that said longitudinal slots are closed and then grinding said pen point ball into a symmetrical shape about the pen point of said pen body; and plastically deforming said pen body such that the slots formed in said pen point ball will be in their closed condition.

4,547,948

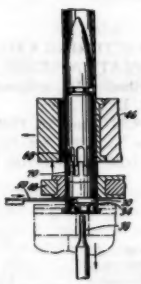
METHOD FOR THE MASS PRODUCTION OF A GASKET-BEARING MOUNTING CUP

Robert H. Abplanalp, 10 Hewitt Ave., Bronxville, N.Y. 10708

Division of Ser. No. 332,510, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 112,791, Feb. 1, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,872

Int. Cl.⁴ B23P *17/00, 11/02*

U.S. Cl. 29—417 **6 Claims**



1. A method for the mass production of a gasket-bearing mounting cup having a panel, a skirt depending from the periphery of the panel and an annular channel extending outwardly from the skirt comprising:

(a) axially aligning and positioning at a distance from each other, the skirt of the mounting cup and a gasket sleeve-bearing, compressible mandrel member having fixed and moveable portions with respect to the mounting cup,

(b) advancing the moveable portion of the sleeve-bearing mandrel toward the mounting cup so as to dispose the sleeve of gasket material onto the skirt of the mounting cup,

(c) returning the moveable portion of the mandrel to its initial position, and cutting the gasket sleeve between the mounting cup and the mandrel, to form a band of gasket material on the mounting cup, and

(d) subsequently, advancing the band of gasket material on the skirt of the mounting cup such that the band of gasket material does not extend beyond the said skirt.

4,547,949

METHOD FOR MOUNTING A RADAR REFLECTOR ON AN ARTILLERY SHELL

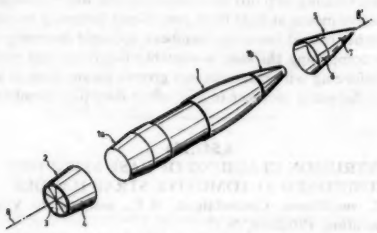
Rudolf Heller, Zurich, and Iwan Khan, Wallisellen, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Continuation of Ser. No. 319,707, Nov. 9, 1981, Pat. No. 4,446,792. This application Feb. 23, 1984, Ser. No. 582,754

Claims priority, application Switzerland, Dec. 2, 1980, 8891/80

Int. Cl.[4] B23P *17/00*

U.S. Cl. 29—421 E 3 Claims



1. A method of mounting a radar reflector on an artillery shell, comprising the steps of:

providing a one-piece turnably-symmetrical body having a lengthwise axis and capable of being fitted onto the artillery shell and constituted by a functional element constructed as a radar reflector of the triple-mirror type containing triple mirrors and a sleeve element formed rotationally-symmetrical about said lengthwise axis of said body;

providing for said body at least one explosive device arranged at least at the neighborhood of an outer surface of said sleeve element near to one end of said sleeve element and remote from said functional element containing said triple mirrors;

mounting said body on the artillery shell;

detonating said explosive device in order to establish a form-locking connection of said sleeve element with the shell; and

severing said sleeve element at the region of said one end of said sleeve element by virtue of the detonation of the explosive charge, in order to provide a substantially straight-lined closure of the sleeve element about the artillery shell in order to avoid undesirably altering ballistic characteristics of the artillery shell.

4,547,950

METHOD OF SPACING THE FOLDS OF A FOLDED FILTER MEDIA

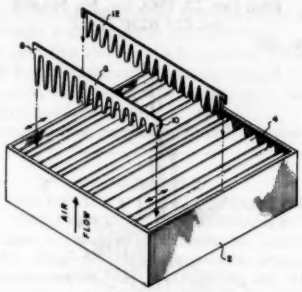
Maynard L. Thompson, Prior Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 29, 1984, Ser. No. 617,058

Int. Cl.[4] B23P *9/00*

U.S. Cl. 29—445 5 Claims

1. A method for spacing the folds of a pleated filter media loosely retained in a peripheral filter enclosure including the steps of progressively inserting a tapered comb having teeth with a tooth depth uniformly varying from a maximum tooth depth at one end of the comb to a minimum tooth depth at the other end of the comb with the teeth being spaced apart the desired distance of the folds in the filter media into the folds of the pleated filter media with each tooth of the comb being located in a respective groove between adjacent folds of the media and subsequently sweeping the tapered comb side-to-



side across the filter media to space apart the folds of the filter media within the enclosure.

4,547,951

METHOD FOR FLUSH MOUNTING A WASHING UNIT IN A WORKING LEAF OR THE LIKE AND STRIP TO BE USED WITH THIS METHOD

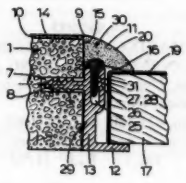
Willem P. van der Kooij, A.van Solmsstraat 1, 2404 GN Alphen a.d.Rijn, Netherlands

Filed Apr. 13, 1983, Ser. No. 484,704

Claims priority, application Netherlands, Apr. 27, 1982, 8201729

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—450 2 Claims



1. A method for flush mounting a washing unit in a counter top or the like comprising the following steps:

providing a strip adapted to be insertably secured to the counter top, the strip having a fastening ribbon member for insertion into the counter top, a web portion, and an upper leg composed of a resilient material; inserting the fastening ribbon into the counter top thereby securing the strip to the counter top; placing a peripheral edge of the washing unit adjacent to the web of the strip and below the upper leg of the strip;

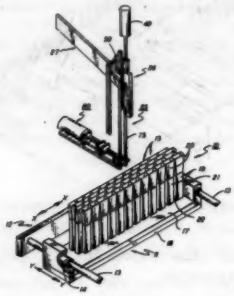
providing an inverted U-shaped portion on one end of the strip having ridges on an internal portion thereof; providing an L-shaped lower leg having ridges on an outer portion thereof; inserting the L-shaped lower leg into the U-shaped lower portion so that te ridges engage and so that the distance between the legs at the point of contact with the washing unit is less than the cross-sectional size of the portion of the washing unit secured therebetween, wherein a watertight seal is provided by the upper leg.

4,547,952

TUBE LOADING APPARATUS

James E. Greever, Dewitt, and Kenneth P. Gray, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,608
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—451 7 Claims



1. A method of placing a hairpin tube having a pair of legs connected by a bend into a loading magazine having a series of open ended vertically disposed compartments that includes the steps of

indexing each of the open ended compartments of the magazine into a tube loading station,

mounting a horizontally extendable ram in the loading station over the compartment,

moving a hairpin tube sequentially from a conveyor to a standby station when the ram is extended and then into the loading station when the ram is retracted,

biasing the legs of the hairpin tube in the loading station inwardly toward each other so the legs can pass freely into the compartment, and

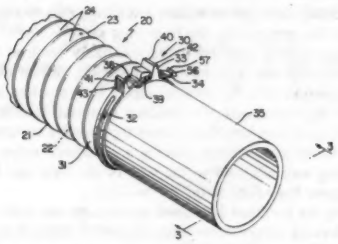
sensing the presence of a hairpin tube in the loading station and extending the ram in response thereto whereby the ram drives the hairpin tube into the compartment.

4,547,953

METHOD OF MAKING A WIRE REINFORCED HOSE CONSTRUCTION INCORPORATING A HOSE CLAMP

William J. LiVolsi, Upper Makefield County, Pa., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 421,180, Sep. 22, 1982, Pat. No. 4,483,556.
This application Aug. 8, 1984, Ser. No. 638,801
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—453 12 Claims



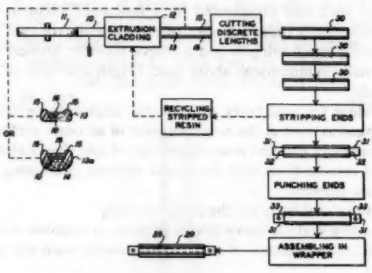
1. In a method of making a hose construction comprising the steps of, providing a hose made primarily of a polymeric material and having reinforcing wire means comprising a wire helically disposed along said hose, connecting a one-piece outer hose clamp structure to said hose, and forming said hose clamp structure to have two ends which when interconnected together define an annular band around said hose and are adapted to secure said hose onto a member telescoped in said hose by tightly engaging a substantially annular portion of said hose around said member, the improvement comprising the steps of forming said hose clamp structure with groove means therein, nestably disposing part of said reinforcing wire means in said groove means, and securing said part of said reinforcing wire means to said hose clamp structure with two fastening members so that said fastening members connect said hose clamp structure to said hose, said securing step further comprising the step of disposing said two fastening members respectively adjacent said opposed ends of said hose clamp structure, said forming step further comprising the step of extending said groove means at least from one of said fastening members to the other of said fastening members, and said disposing step further comprising the step of nestably receiving said part of said reinforcing wire means in said groove means from at least said one fastening member to said other fastening member.

4,547,954

EXTRUSION CLADDING OF BASE STRIP FOR CUSHIONED AUTOMOTIVE STRAP HANDLE

Dick T. vanManen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Continuation-in-part of Ser. No. 211,431, Nov. 28, 1980, abandoned. This application Jul. 1, 1983, Ser. No. 510,414
Int. Cl.[4] B29D *27/00;* B23P *25/00*
U.S. Cl. 29—458 12 Claims



1. A method of extrusion cladding onto a base strip for assembly into a cushioned automotive pull strap handle, said method comprising:

a. feeding a continuous length of said base strip through the die of an extrusion coating means;

b. extrusion cladding a resin material surrounding said base strip and providing raised shoulders extending along longitudinal side edges of said strip;

c. cutting discrete strips from said continuous strip;

d. cutting and stripping away said resin material of said cladding from end regions of said discrete strips;

e. punching apertures in said end regions for said discrete strips; and

f. assembling said discrete strips within a cover to form said strap handles.

4,547,955

AUTOMATIC TOOL EXCHANGING SYSTEM

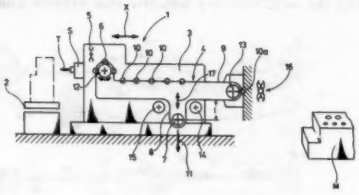
Tadataka Shiomi; Kouichi Nabika, both of Gifu, and Takashi Kawagoe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed May 21, 1982, Ser. No. 380,814
Claims priority, application Japan, May 24, 1981, 56-79008
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 8 Claims

1. In a tool exchanging system for a numerically controlled

machining tool, in which a tool column, stored with tools to be fed to a spindle head of said numerically controlled machining tool, is adapted to move in accordance with the movement of said spindle head so as to maintain a fixed relationship between a first tool exchange position of said tool column and said spindle head whereat a first automatic tool exchange robot may exchange tools between said spindle head in said tool column, the improvement comprising:

a tool magazine, controllably positionable adjacent said tool column, said tool magazine transporting a complement of tools from a remote location;



means, cooperatively adapted to said tool column, for exchanging tools between the tool magazine and said tool column at a second tool exchange position in a manner allowing said spindle head to continue its machining operation motions during the tool exchange between said tool magazine and said tool column and for maintaining a fixed positional relationship between said tool magazine and the second tool exchange position of said tool column whenever said first automatic tool exchange robot exchanges tools between said tool column and said first tool exchange position.

4,547,956

PROCESS FOR PRODUCING A SEMICONDUCTOR LASER WITH SEVERAL INDEPENDENT WAVELENGTHS AND LASER OBTAINED BY THIS PROCESS

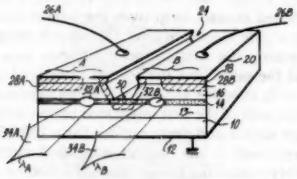
Noureddine Bouadma, 45 A, Blvd. Jourdan, 75014 Paris; Jean-Claude Bouley, 35 Avenue du Dr. Durand, 94110 Arcueil, and Jean Riou, 25, Avenue de la division Leclerc, 94230 Cachan, all of France

Filed Mar. 28, 1983, Ser. No. 479,579

Claims priority, application France, Apr. 8, 1982, 82 06179

Int. Cl.[4] H01S *3/19*

U.S. Cl. 29—569 L **4 Claims**



1. A process for producing a laser emitting two wavelengths, comprising the steps of:

providing a semiconductor substrate;

producing on said substrate by epitaxy a first double heterostructure comprising a first confinement layer, a first active layer having a first composition, a second confinement layer, a first contact layer and a first upper metal coating;

etching said first double heterostructure up to said substrate through a mask having openings in the form of strips, this etching operation leading to strips of said double heterostructure, said strips being separated by etched portions;

producing on said substrate in the said etched portions a second double heterostructure with a third confinement layer, a second active layer having a second composition different from the first, a fourth confinement layer, a second contact layer and a second upper metal coating, said layers of said first double heterostructure and said layers of said second double heterostructure having the same height with respect to said substrate;

carrying out a first etching of a first groove between a strip of said first heterostructure and said second double heterostructure, said groove being etched up to said first and second active layers; and

undergoing a proton bombardment into said first groove.

4,547,957

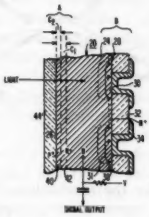
IMAGING DEVICE HAVING IMPROVED HIGH TEMPERATURE PERFORMANCE

Eugene D. Savoye, Lancaster, and Charles M. Tomasetti, Leola, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 387,365, Jun. 11, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 636,562

Int. Cl.[4] H01L *31/18, 27/14*

U.S. Cl. 29—572 **8 Claims**



1. A method of making an imaging device having improved high temperature performance comprising the steps of:

preparing a silicon wafer of a first type conductivity, said wafer having first and second major surfaces;

forming a capping oxide on at least said second major surface of said wafer;

introducing an element through said capping oxide into said second major surface of said wafer so as to form a region of enhanced first type conductivity contiguous with said second major surface of said wafer;

annealing said wafer at an elevated temperature and thereafter

removing said capping oxide from said wafer;

forming an insulating layer on said second major surface of said wafer;

providing a plurality of apertures through said insulating layer;

forming a plurality of regions of a second type conductivity through said apertures, said second type conductivity regions extending into said wafer from said second surface a distance greater than said region of enhanced first type conductivity;

introducing an element into said first major surface of said wafer so as to form a region of enhanced first type conductivity for controlling blooming, said region being spaced from said first major surface;

activating said introduced element by heating said wafer at an elevated temperature; and

forming a shallow region of a second type conductivity extending into said wafer from said first major surface for a distance less than said region of enhanced first type conductivity for controlling blooming, said shallow region of second type conductivity and said region of enhanced first type conductivity for controlling blooming acting in combination to prevent minority carriers from localized sites on the first major surface of the wafer from

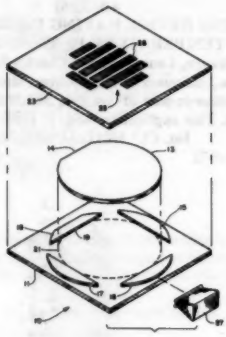
reaching said regions of second type conductivity extending into said wafer from the second major surface thereof.

4,547,958

VMJ SOLAR CELL FABRICATION PROCESS USING MASK ALIGNER

Diane K. Hufford, Vance AFB, Okla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 16, 1984, Ser. No. 610,911
Int. Cl.[4] H01L *31/18*
U.S. Cl. 29—572 **1 Claim**



1. In a process for the fabrication of a vertical junction silicon solar cell, an improvement comprising the steps of:

a. providing a silicon wafer having substantially parallel surfaces along a first predetermined crystallographic plane of said silicon;

b. cleaving said wafer along a second predetermined crystallographic plane substantially perpendicular to said first plane to provide a straight edge on said wafer of known orientation;

c. providing a base plate having a recess therein defining an opening for snugly receiving said wafer, said recess including a substantially straight portion for abutment with said cleaved straight edge of said wafer, said recess having a depth slightly less than the thickness of said wafer;

d. positioning said wafer within said recess with said cleaved straight edge abutting said straight edge of said recess; and

e. providing a mask plate for covering said base plate and wafer, said mask plate including a pattern thereon in predetermined configuration and orientation through which said wafer may be exposed in said fabrication process for said solar cell.

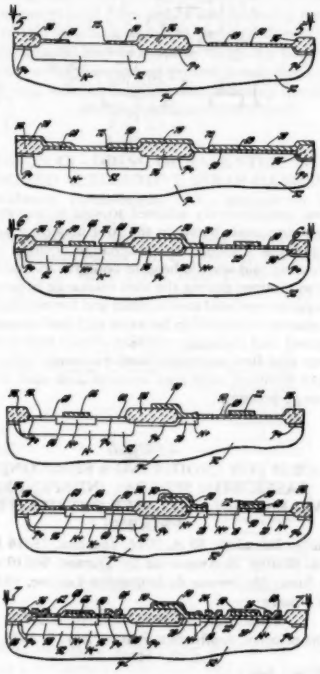
4,547,959

USES FOR BURIED CONTACTS IN INTEGRATED CIRCUITS

Randy A. Rusch, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1983, Ser. No. 468,149
Int. Cl.[4] H01L *21/82, 21/90*
U.S. Cl. 29—577 C **9 Claims**

1. In a method of making a monolithic integrated circuit having buried contacts and complementary insulated gate transistors, some of which transistors are disposed in N-type wells, the improvement of additionally making a bipolar lateral PNP transistor in a selected surface area of the integrated circuit while making the insulated gate transistors without adding any significant process step in making the integrated circuit to the process steps needed to make the complementary monolithic integrated circuit without the bipolar lateral PNP transistor, the improved method including providing first and second integrated circuit surface areas, each having an N-type well and a dielectric coating, providing a third integrated circuit surface area that has a dielectric coating but not an N-well, opening a well-bisecting window in the dielectric coating over the first integrated circuit area when opening a buried contact window in the dielectric coating over the third integrated circuit area, depositing a blanket polycrystalline silicon coating over all three areas, providing an N-type doping in the polycrystalline silicon coating before it is patterned that also induces an N-type doping in integrated circuit surface area portions exposed in the windows, patterning the polycrystalline silicon coating to form a polycrystalline silicon strip crossing the well-bisecting window that extends completely



across the N-type well when also forming a polycrystalline silicon buried contact strip over the buried contact window area and a gate electrode over the second integrated circuit area, exposing the first integrated circuit area to a P-type dopant at the same time the second integrated circuit area is exposed to it, effective to form emitter and collector regions in the N-type well of the first integrated circuit area when forming P-type source and drain regions for a PMOS transistor in the N-type well in the second integrated circuit area, and respectively contacting the emitter and collector regions in the first integrated circuit area when contacting the source and drain in the second integrated circuit area.

4,547,960

METHODS OF AND FIXTURE FOR ESTABLISHING AN ELECTRICAL CONNECTION

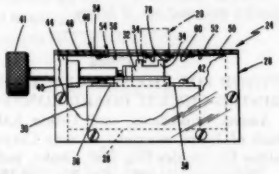
Anthony J. DiTroia, Andover, Mass., assignor to AT&T Technologies, Inc., New York, N.Y.

Continuation of Ser. No. 373,196, Apr. 29, 1982, abandoned.
This application Apr. 1, 1985, Ser. No. 707,307
Int. Cl.[4] H01R *13/54*; G01R *31/02*
U.S. Cl. 29—593 **3 Claims**

1. A method of establishing a temporary electrical connec-

tion between a circuit and a plurality of leads arranged in at least two rows of an electrical component which includes a body wherein the circuit is formed on a first major surface of a substrate having contacts mounted thereon which are electrically connected to the circuit, each contact having a portion overlapping an associated one of a plurality of non-conductive apertures formed through the substrate, and each lead having a diameter which is smaller than the diameter of its associated aperture, the method comprising the steps of:

inserting the plurality of leads of the electrical component in the plurality of non-conductive apertures formed through the substrate so that the component body rests on a second



major surface of the substrate and respective end portions of the leads protrude from said substrate;

moving the plurality of leads laterally of and within the plurality of apertures into engagement with respective contacts while sliding the component body over the second major surface of the substrate;

urging the tip-end portions of the plurality of leads into flexed and uncrimped engagement with the portion of the respective contacts which overlaps the associated one of the non-conductive apertures for testing;

unflexing the plurality of leads; and

removing the plurality of uncrimped leads from the apertures.

4,547,961

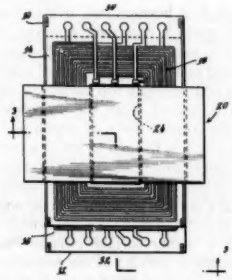
METHOD OF MANUFACTURE OF MINIATURIZED TRANSFORMER

Delip R. Bokil, Winchester, and William H. Morong, III, Newton, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Continuation-in-part of Ser. No. 206,838, Nov. 14, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,805

Int. Cl.⁴ H01F *41/06*

U.S. Cl. 29—602 R **4 Claims**



1. The method of making a miniaturized transformer comprising the steps of:

supporting on rigid non-magnetic substrate means a first metallization pattern in the form of a matrix of conductive particles arranged in a multi-turn planar spiral winding configuration about a central opening in the substrate means;

applying a first overlay of high-temperature firable dielectric insulating material to cover said first metallization pattern;

supporting on said substrate means a second metallization pattern in the form of a matrix of conductive particles arranged in a multi-turn planar spiral winding configuration about the central opening of said substrate means; said second winding being essentially coextensive with said first winding and conductively isolated therefrom;

applying a second overlay of high-temperature firable dielectric insulating material to cover said second metallization pattern;

firing said conductive particles and said dielectric material at a high temperature to fuse said conductive particles into continuous conductors forming separate planar windings and to solidify said insulating dielectric material to form rigid pancake-like structures with said windings embedded and hermetically sealed therein;

placing in said central opening a pre-formed solid magnetic core having a return path completely surrounding said substrate means;

establishing two pairs of connections to the ends of said two windings, respectively, with one connection of each pair extending across the corresponding winding to the interior region adjacent said central opening;

said pairs of connections being established by:

applying a third metallization pattern over one of said overlays of insulating dielectric to form a path from the inner part of the corresponding spiral winding to a region adjacent the outer part of the spiral by depositing conductive material on said substrate means to form a cross-over conductive pattern over said windings;

depositing conductive material on said substrate while laying down said first and second patterns to form at least one vertical staircase conductor in the interior of the spiral windings and leading from one winding end to said conductive cross-over;

applying a third overlay of high-temperarture firable dielectric insulating material to cover said third metallization pattern;

firing the conductive particles of said third metallization pattern and said third overlay of dielectric insulating material to form said particles into a continuous conductor running along said path and to solidify said third overlay of dielectric insulating material, thereby to form said cross-over pattern of conductive material for establishing connections to the inner part of said spiral winding; and

firing said additional layer at high temperature thereby embedding said conductive cross-over in said layer for providing interconnections between said windings.

4,547,962

METHOD OF MAKING EDDY-CURRENT PROBES

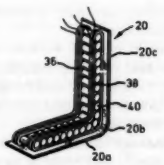
Stewart deWalle, and Richard T. deWalle, both of Rexdale, Canada, assignors to Miep Holdings Inc., Rexdale, Canada

Filed Oct. 7, 1982, Ser. No. 433,294

Claims priority, application Canada, Oct. 9, 1981, 387668

Int. Cl.⁴ H01F *41/00*

U.S. Cl. 29—606 **7 Claims**



1. A method of making an eddy-current probe for the scanning of a test surface having a corresponding non-flat profile in

a plane which intercepts the test surface so as to include the profile, the method including the steps of:

(a) applying to said test surface so as to be intercepted by the plane, and so as to conform to the test surface profile, a support member having parallel front and back surfaces with the front surface immediately adjacent to the test surface,

(b) applying to the support member back surface so as to be intercepted by the plane, and so as to conform to said test surface profile, a first portion of a probe electrical test coil, and

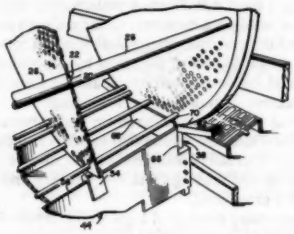
(c) mounting inside the electrical test coil immediately adjacent to the said first portion of said test coil a plurality of separate ferrite core elements so as to be intercepted by the plane to said test surface profile.

4,547,963

APPARATUS AND METHOD FOR INSERTING TUBES INTO A HEAT EXCHANGER FRAME

Robert L. Ohmstede, Beaumont, Tex., assignor to Ohmstede Machine Works, Inc., Beaumont, Tex.

Filed Jun. 15, 1983, Ser. No. 504,421
Int. Cl.⁴ B23P *15/26*
U.S. Cl. 29—726 **10 Claims**



1. For inserting tubes in a heat exchanger frame which includes two opposite tube sheets, a plurality of transverse baffles arranged in a series extending longitudinally between the tube sheets, and securement means extending longitudinally between the tube sheets at a plurality of peripheral sites and maintaining longitudinal spacing of said tube sheets and baffles, where the tube sheets and baffles each have a like arrangement of holes formed therethrough comprising a plurality of rows of holes, and rows being at correspondingly different levels, each such hole in a tube sheet and baffle being a member of a respective set of corresponding substantially coaxially aligned holes in others of said tube sheets and baffles, apparatus, comprising:

(a) means for supporting the heat exchanger frame on a foundation so that corresponding rows of holes through each tube sheet and said baffles are substantially horizontal and at the same level, the means for supporting the heat exchanger frame including:

rail means fixed on a foundation;

a base mounted for guided movement along said rail means;

the base including upwardly concavely arcuate circularly curved trunnion means;

complementarily curved rocker means journalled for rotation on said trunnion means; and

a support bed mounted on said rocker means, said support bed being constructed and arranged to bear said heat exchanger frame thereon;

(b) means for locking the heat exchanger frame relative to said support means and relative to the foundation so that the frame will not be substantially longitudinally displaced as tubes are longitudinally inserted therein through one said tube sheet thereof;

(c) a platform assembly;

(d) said platform assembly includes a substantially horizontal transversally extending rail means;

(e) a motorized tube feeder mounted on said rail means for transverse movement along said rail means, said motorized tube feeder having means defining a nip aimed to face said one tube sheet when said heat exchanger frame is supported on said support means; and

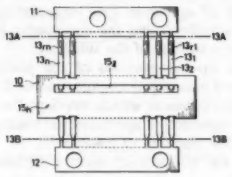
(f) means for vertically adjustably moving and disposing said platform assembly so that the nip of said motorized tube feeder may be brought to the level of a row, whereupon said motorized feeder may be moved transversally along said rail means for centering the nip on an individual said set of holes so that a tube may be fed through said motorized feeder into said set of holes.

4,547,964

METHOD FOR THE MANUFACTURE OF A PRINTED-CIRCUIT BOARD CONNECTOR

Katutoshi Amano, Yokohama, and Toshio Kakuta, Higashi-osaka, both of Japan, assignors to Sony Corporation, Tokyo and Hosiden Electronics Co., Ltd., Osaka, both of, Japan

Filed Aug. 1, 1983, Ser. No. 519,171
Claims priority, application Japan, Aug. 9, 1982 57-138103
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—883 **9 Claims**



1. A printed-circuit board connector manufacturing method comprising:

forming out of a sheet of metal a contact array plate having substantially parallel first and second coupling pieces and a plurality of contact pieces formed integrally therewith to extend therebetween;

molding a first housing half of a synthetic resinous material integrally with the contact array plate so that the intermediate portions of the contact pieces are embedded in the molding and the two ends of each of said contact pieces project outwardly from an exterior face of said first housing half, said first housing half being shaped to define a plurality of contact receiving grooves that correspond respectively to said plurality of contact pieces and extend parallel to said contact pieces, each of said contact receiving grooves comprising a top surface of said first housing half which is spaced from the embedded intermediate portion of the contact piece to which said groove corresponds and which is formed to act as a bending die for an outwardly projecting end of a corresponding contact piece, the shape of each said top surface including a curved surface portion adjacent said outwardly projecting ends of the associated contact piece which curved portion merges into a further surface portion that extends in a direction generally parallel to the embedded intermediate portion of the corresponding contact piece;

cutting off the first and second coupling pieces of the contact array plate assembled with the first housing half to separate the plurality of contact pieces from one another;

bending the outwardly projecting end portions of the plurality of separated contact pieces which are disposed adjacent said curved surface portions of said top surfaces into contact with and along the curved surface portions of the corresponding contact receiving grooves in said first housing half to form contact propers whose bent configu-

rations are defined by the shapes of said top surfaces acting as bending dies;

said molded first housing half having a bottom surface adjacent the other outwardly projecting end portions of the plurality of separated contact pieces, bending the outwardly projecting other end portions of the plurality of separated contact pieces which are disposed adjacent said bottom surface into engagement with said bottom surface to form contact terminals; and

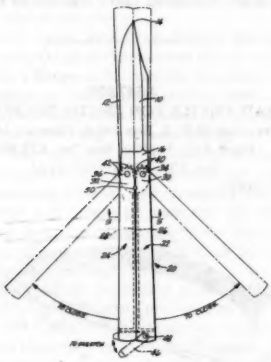
fixedly assembling a second housing half with the first housing half with said contact propers disposed between said first and second halves, said assembly being effected in a manner to define an insertion opening between said first and second housing halves for receiving a mating connector that engages said contact propers.

4,547,965

SYNCHRONIZED FOLDING KNIFE

Donald M. Moore, 1206 S. Mayflower, Arcadia, Calif. 91006

Continuation of Ser. No. 369,162, Apr. 16, 1982, abandoned.
This application Feb. 17, 1984, Ser. No. 581,177
Int. Cl.⁴ B26B *1/10, 29/02;* **F16N** *21/44*
U.S. Cl. 30—153 **2 Claims**



1. A knife comprising:

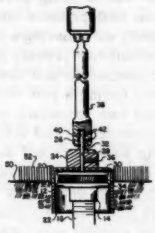
an elongated blade having a shank portion at one end, first and second elongated channel-shaped handles, having two parallel spaced side walls and a connecting outer edge wall, the side walls of each channel-shaped handle extending beyond one end of the connecting outer edge wall to form a clevis into which the shank portion of the blade extends, a pair of hinge pins extending through the clevis portion of the respective handles and through the shank portion of the blade to pivotally secure each of the handles to the blade, the two side walls of each channel-shaped handle at the clevis portion being rounded at the outer end in a radius about the respective hinge pins, and gear teeth projecting radially from the two rounded sides of each handle, the projecting teeth from the two sides of one handle meshing with the teeth from the two sides of the other handle, whereby rotation of one handle drives the other handle in the opposite direction of rotation relative to the blade, the gear teeth projecting radially outwardly beyond the margins of the respective handles when the handles are rotated to the fully open position with said connecting edge walls in abutting relationship, whereby the gear teeth are exposed and provide a better grip of the handles.

4,547,966

SPRINKLER HEAD TRIMMER AND CLEANER

Brian W. Eden, 1404 Taft, Escondido, Calif. 92026

Filed Aug. 10, 1984, Ser. No. 639,461
Int. Cl.⁴ B26B *27/00*
U.S. Cl. 30—300 **12 Claims**



1. A combination sprinkler head trimmer and cleaner, comprising:

an elongated drive shaft;

generally cylindrical cup shaped cutting head having an axially directed circular cutting edge mounted coaxially on the end of said drive shaft for positioning around a sprinkler head; and

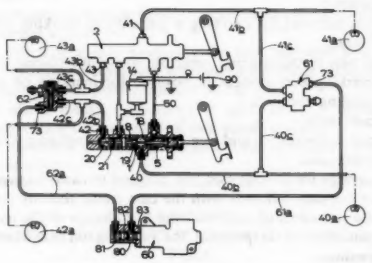
a brush mounted concentrically of said cutting head and recessed from said cutting edge for engaging and cleaning a sprinkler head.

4,547,967

VEHICLE HYDRAULIC BRAKING SYSTEM

Desmond H. J. Reynolds, West Midlands, England; Anthony G. Price, Gwent, Wales, and Roy Campbell, Worcestershire, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed May 21, 1984, Ser. No. 612,574
Claims priority, application United Kingdom, May 21, 1983, 8314113
Int. Cl.⁴ B60T *11/00, 13/12*
U.S. Cl. 303—7 **7 Claims**



1. An hydraulic braking system for a vehicle-trailer combination wherein brakes are provided on wheels on opposite sides of said vehicle, and brakes are provided on wheels of said trailer, said system comprising first and second hydraulic master cylinders which are operable simultaneously to apply said brakes on both sides of said vehicle and brakes on said trailer for simultaneous vehicle and trailer retardation, and which are operable independently to apply said brakes on one side of said vehicle to facilitate steering, and means for preventing application of said brakes on said trailer when one of said master cylinders is operated on its own, wherein each said master cylinder is of tandem construction having a primary pressure space and a secondary pressure space, said primary pressure

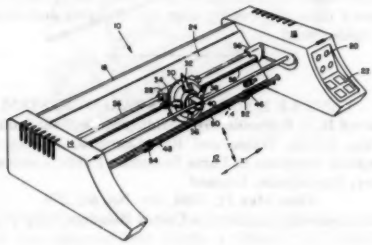
spaces are connected to said brakes of one pair of wheels on opposite sides of said vehicle, the secondary pressure spaces are connected to said brakes of another pair of wheels on opposite sides of said vehicle, and actuator means for the brakes on said trailer is supplied with fluid under pressure from pipe-lines connected to each of said four pressure spaces, first and second disabler valves being provided to control said supply of fluid from said pressure spaces to said actuator means, said first disabler valve having a pair of inlet ports, each connected to one of said two primary pressure spaces, and a single outlet port connected to said actuator means, and said second disabler valve having a pair of inlet ports, each connected to one of said two secondary pressure spaces, and a single outlet port connected to said actuator means, said two disabler valves being so constructed and arranged that said actuator means can be supplied with fluid under pressure from one of said pressure spaces only when subjected to substantially equal pressures from said two pressure spaces to which said inlet ports of that disabler valve are connected.

4,547,968

DESKTOP PLOTTER INSTRUMENT

David A. Petersen, Austin, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 3, 1984, Ser. No. 608,647
Int. Cl.⁴ B43L *13/00*
U.S. Cl. 33—32 R **16 Claims**



1. A plotter instrument for marking on a recording medium, comprising:

a pen carousel for carrying a plurality of marking pen elements;

said pen carousel being rotatable to permit placement of a marking pen element in position for marking on the recording medium;

a cam track;

a cam follower on said pen carousel for engaging said cam track; and

a carriage for driving said pen carousel to cause engagement of the cam follower with the cam track, thereby rotating the pen carousel and resulting in a change of the marking pen element in position for marking on the recording medium.

4,547,969

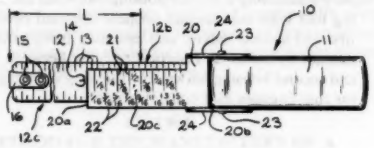
FRACTION INDICATOR AND METHOD OF USE

Brian P. Haack, 2050 Haslett Rd., Haslett, Mich. 48840

Filed Jan. 30, 1984, Ser. No. 575,142
Int. Cl.⁴ G01B *3/10*
U.S. Cl. 33—138 **13 Claims**

1. In a tape measure (10) including a housing (11) with an opening (16) and a tape (12), with first fraction marks (13) marked along a length and on at least one of two opposing edges (12*b*, 12*c*) of the tape and with whole numbers (14) showing the increments of measurement, the tape being disposed in the housing and projecting through the opening so that the tape can be extended from the housing for measuring and coiled in the housing for storage of the tape the improvement which comprises:

a fraction indicator (20) mounted on the housing adjacent the opening wherein the fraction indicator has an elongate surface (20c) between two opposing ends (20*a* and 20*b*) one of which is away from the housing which is superimposed over the tape so that the first fraction marks are visible to a user and wherein the fraction indicator is



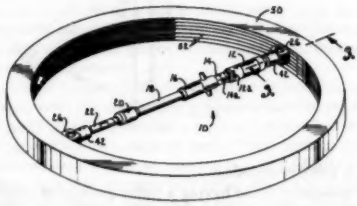
marked with fractions (22) of measurement in arabic numerals adjacent second fraction marks (21) in increments between two whole numbers with the fractions increasing in amount towards the housing and wherein the indicator has a length of the elongate surface and can be positioned adjacent the first fraction marks with the end of the elongate surface away from the housing on a whole number of the tape so that a selected first fraction mark on the tape can be easily translated into a fraction by the user.

4,547,970

THREAD ANVILS FOR INSIDE MICROMETER

Albert L. Brewster, R.R. 2, Box 190A, Pleasant Hill, Mo. 64080

Filed Aug. 3, 1984, Ser. No. 637,
Int. Cl.⁴ G01B *3/18, 5/12*
U.S. Cl. 33—167 **20 Claims**



1. A thread gauge for application to opposite ends of an inside micrometer to measure the thread pitch diameter of an internally threaded part, said thread gauge comprising:

a pair of anvils each presenting external threads having substantially the same pitch as the threads of the internally threaded part;

a tooling ball for each anvil, each tooling ball including a ball element and a stem extending from the ball element;

means for mounting each anvil on the corresponding tooling ball in a manner permitting the anvil to rotate on the ball element and move linearly on the ball element in a direction generally perpendicular to the stem; and

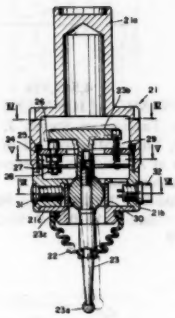
means for connecting said stems to the opposite ends of the micrometer to mount each anvil thereon at a predetermined location relative to the corresponding end of the micrometer, whereby the micrometer can be adjusted to position the threads of the anvils against the threads of the internally threaded part at diametrically opposed locations thereon to provide a measurement of the pitch diameter of the internally threaded part.

4,547,971

TOUCH SENSOR

Hiroyuki Imazeki, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Apr. 18, 1984, Ser. No. 601,583
Claims priority, application Japan, Apr. 22, 1983, 58-61165
Int. Cl.⁴ G01B 5/25
U.S. Cl. 33—169 R **8 Claims**



1. A touch sensor comprising:

(a) a casing including a shank adapted to be mounted on a machine tool or the like;

(b) a generally linear measuring element having a contact which is adapted to abut against an object to be measured at one end, a flange at the opposite end, and a ball bearing formed about an intermediate portion thereof, the flange and the ball bearing being disposed inside said casing and the contact protruding from said casing;

(c) a base plate mounted in said casing at least generally perpendicularly to the at rest position of said generally linear measuring element, said measuring element extending through said base plate such that the flange of said measuring element is on one side of said base plate and the contact of said measuring element is on the other side of said base plate;

(d) supporting means comprising at least three symmetrically positioned projections provided on said base plate to support the flange of said measuring element when said measuring element is in its at rest position;

(e) at least one elastic means for biasing the flange of said measuring element towards contact with said at least three symmetrically positioned projections;

(f) a cylindrical bearing disposed in said casing in position to journal the ball bearing formed on said measuring element for both linear and pivotal movement, said cylindrical bearing and the ball bearing on said measuring element having dimensions which initially provide clearance therebetween; and

(g) at least three symmetrically positioned adjusting screws threadedly mounted in said casing and bearing against the external surface of said cylindrical bearing, whereby said at least three symmetrically positioned adjusting screws can be used to deform said cylindrical bearing into contact with the ball bearing on said measuring element.

4,547,972

TILT SENSOR AND MONITORING SYSTEM

Jeffrey C. Heidel, Phoenix; Thomas R. Hoogervorst, Scottsdale; Lynn R. Lane, Phoenix, and Harold L. Swartz, Glendale, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,907
Int. Cl.⁴ C01C 9/06
U.S. Cl. 33—366 **20 Claims**

1. Apparatus for sensing angular displacement of an inanimate body from a reference axis, comprising:

(a) a mounting plate for securing said apparatus to said body;

(b) a sensor assembly secured to said mounting plate, said assembly including:

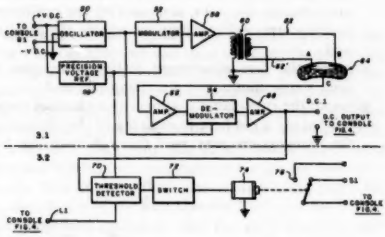
means for providing a pulsed audio-frequency excitation signal of predetermined amplitude,

an electrolytic bubble level sensor,

means for differentially exciting said electrolytic bubble level sensor with said signal, thereby to provide a pulsed output signal whose magnitude and polarity depend on the inclination of said level sensor from a reference axis, said pulsed output signal having a null value when said level sensor is aligned with said reference axis,

demodulator means responsive to said pulsed excitation signal and to said pulsed output signal for converting said pulsed output signal to a bidirectional direct current output signal,

means for providing a control signal corresponding to a predetermined angular displacement of said level sensor from said reference axis,



means for comparing said control signal with said bidirectional output signal, thereby to provide an indicator signal when said predetermined angular displacement is exceeded;

(c) control means for providing sensor control signals;

(d) means for remotely coupling said sensor assembly to said control means and for receiving signals representative of said inclination, said signals comprised of said bidirectional direct current output signal and said indicator signal;

(e) numerical readout means, responsive to said bidirectional output signal;

(f) indicator means, responsive to said indicator signal, for registering a condition wherein said angular displacement exceeds said predetermined value;

(g) alarm means, responsive to said indicator means, for signalling the presence of said condition; and

(h) means for providing said bidirectional output signal to a recorder.

4,547,973

TRAMMEL POINT ATTACHMENT TO STEEL TAPE RULE

Fred L. Owens, 3232 San Mateo NE., Albuquerque, N. Mex. 87110

Filed Sep. 28, 1984, Ser. No. 655,909
Int. Cl.⁴ B43L 9/04; G01B 5/00
U.S. Cl. 33—27 C **2 Claims**

1. A set of attachments comprising:

a zero attachment and a case attachment wherein the zero attachment affixes to a steel tape rule at the zero end and wherein the case attachment affixes to the case of the steel tape rule, and

wherein the zero attachment further comprises a locking arm, a rule clamp, and a scribing pin, and

wherein the rule clamp is generally a channel shaped member having a pin hole in each leg of the channel such that the scribing pin may pass through both pin holes, and

wherein the rule clamp has jaws formed into the extremities of the channel legs into which the steel tape rule may be slipped and wherein the jaws extend slightly wider than the channel shaped rule clamp, and wherein the rule clamp has notches to accept the locking arm, and

wherein the scribing pin has two locking arm holes spaced along the length of the scribing pin so that when the scribing pin is inserted into the pin holes in the rule clamp, each locking arm hole is barely outside of the channel, and

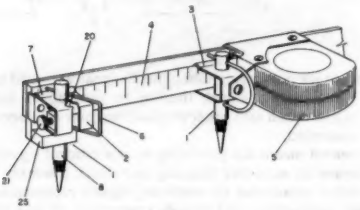
wherein the locking arm is a small U shaped rod whose U is slightly larger than the width of the channel of the rule clamp and the locking arm is shaped to be slideably inserted into the locking arm holes in the scribing pin, and

wherein the rule clamp has an accessory hole to accomodate an accessory such as a pencil or stick of soapstone, and wherein the rule clamp has mounted therein a set screw to secure the accessory, and

wherein the free ends of the U of the locking arm extend sufficiently so that they engage the jaws when the locking arm is so positioned and do not engage the jaws when alternatively positioned, the positioning occurring when the scribing pin is rotated by means of the locking arm, and wherein the jaws, activated by the positioning of the locking arm, either clamp or release the steel tape rule, and

wherein the case attachment further comprises a locking arm, a rule clamp, and a scribing pin, and

wherein the rule clamp is generally a channel shaped member having a pin hole in each leg of the channel such that the scribing pin may pass through both pin holes, and



wherein the rule clamp has jaws formed into the extremities of the channel legs into which the steel tape rule may be slipped and wherein the jaws extend slightly wider than the channel shaped rule clamp, and wherein the scribing pin has two locking arm holes spaced along the length of the scribing pin so that when the scribing pin is inserted into the pin holes in the rule clamp, each locking arm hole is barely outside of the channel, and

wherein the locking arm is a small U shaped rod whose U is slightly larger than the width of the channel of the rule clamp and the locking arm is shaped to be slideably inserted into the locking arm holes in the scribing pin, and

wherein the locking arm has on the interior of the U and adjacent to the extremities of the U, a slip groove on each leg of the U shaped locking arm, and and each leg of the locking arm has a burr which prevents the locking arm from sliding too far into the locking arm pin holes, and

wherein the case attachment has a support channel, said support channel having rigidly affixed thereto a trapezoidal hanging tongue and said hanging tongue having therein a hanging hole, and said hanging tongue being affixed to the rule clamp by means of a bolt through the hanging hole and the bolt hole and secured by a nut, and said support channel being sized to mate with the case of the steel tape rule and to be secured thereto by screws, and said support channel having a channel slot which is sized to accept a slide bar and said channel slot being positioned parallel to and adjacent to the base of the case, and

wherein when the locking arm is positioned approximately perpendicular to the steel tape, the slip grooves engage the exterior surface of the jaws allowing the jaws to spread and the steel tape therein to be slid and the locking arm is stopped by the trapezoidal hanging tongue from rotating further toward the case, and when the locking arm is alternatively positioned, the full thickness of the locking arm engages the jaws and causes the jaws to clamp and hold the steel tape therein.

4,547,974

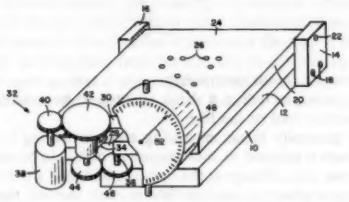
DYNAMIC ALIGNMENT FIXTURE

Troy L. Hester, Tuscaloosa; Steven J. Thompson, University, and James R. Long, Madison, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 20, 1984, Ser. No. 652,258

Int. Cl.[4] G01B *3/56, 5/24*

U.S. Cl. 33—537 **4 Claims**



1. A dynamic alignment fixture comprising a base plate having surfaces thereon, a pivot plate having a top flat surface and being pivotably mounted at one end to one end of said base plate with said pivot plate positioned over said base plate, a resolution displacement gauge mounted to said pivot plate at the other end thereof and said gauge having an indicator for indicating the position of said pivot plate relative to said base plate, and a motor driven screw-jack assembly means mounted at the other end of said base plate and having a screw that can be adjusted up and down relative to said pivot plate for adjusting said pivot plate to raise or lower said pivot plate relative to said base plate to cause it to pivot about its pivot mounting at said one end.

4,547,975

METHOD AND APPARATUS FOR ADJUSTING THE QUANTITY OF WATER DEPOSITED ON A FINE AGGREGATE

Yasuro Ito; Yoshiro Higuchi, both of Tokyo, and Sélichi Aida, Chiba, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,798

Claims priority, application Japan, Sep. 13, 1983, 58-167513; Sep. 21, 1983, 58-145042[U]

Int. Cl.[4] F26B *5/08*

U.S. Cl. 34—8 **21 Claims**

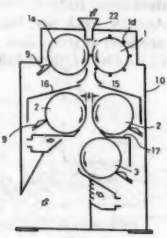
1. A method for adjusting the quantity of water deposited on particles of fine aggregate which comprises

supplying said particles having a quantity of initial surface water larger than a predetermined quantity,

projecting said particles at a given velocity against at least one rotating surface, causing said particles to collide against said surface whereby a portion of the quantity of

said initial surface water is removed and transferred from said particles and onto the rotating surface,

removing the water collected on the rotating surface, and



recovering the particles which have been treated having a uniform and optimum quantity of surface water.

4,547,976

ADDITION OF FILLERS TO THE BED OF A PARTICLE FORM EVAPORATOR

William R. King, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1982, Ser. No. 426,433

Int. Cl.[4] F26B *3/08*

U.S. Cl. 34—10 **15 Claims**

1. In a process for drying a polymer solution comprising polymer and solvent which comprises introducing the polymer solution into an agitated bed of polymer particles; wherein said bed is mechanically agitated in a manner sufficient to cause evaporation of a substantial portion of said solvent, the improvement comprising introducing at least one filler into said bed; wherein said at least one filler is selected from the group consisting of:

silica,
sand,
calcium carbonate,
clay,
hydrated aluminum silicate,
magnesium silicate,
kaolin,
feldspar,
mica,
aluminum hydroxide,
ZnO,
ZnS,
TiO_2,
$BaSO_4$,
barytes,
asbestos,
cotton,
jute,
wood,
nylon,
wool,
glass,
carbon black,
amorphous graphite, and
crystalline graphite;

wherein said at least one filler is introduced in an amount sufficient to reduce the average size of said polymer particles in said bed.

4,547,977

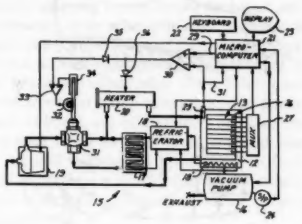
FREEZE DRYER WITH IMPROVED TEMPERATURE CONTROL

Kenneth J. Tenedini, New Paltz, and David T. Sutherland, Kingston, both of N.Y., assignors to The VirTis Company, Inc., Gardiner, N.Y.

Filed May 21, 1984, Ser. No. 612,328

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—46 **4 Claims**



1. A temperature control system for a freeze dryer of the type having a drying chamber and shelf assembly for receiving the product to be dried, a vacuum pump for evacuating the drying chamber, a low temperature condenser for condensing water vapor from the drying chamber, and a heat transfer system for regulating the temperature of the shelf assembly including a heater for applying heat to a heat transfer fluid, a refrigerator and low temperature heat exchanger for removing heat from the heat transfer fluid, and a circulation pump for providing circulation of the heat transfer fluid past the heater, low temperature heat exchanger and the shelf assembly, said temperature control system having means for providing a desired temperature of the shelf assembly as a predetermined function of time defining a freeze drying cycle, at least one temperature sensor sensing the temperature of the heat being applied to the product in the drying chamber, and means for selectively energizing said heater when said desired temperature is greater than the second temperature, wherein the improvement comprises

means for regulating said circulation of said heat transfer fluid past said low temperature heat exchanger in response to a cooling control signal, and

means for generating said cooling control signal when said desired temperature is less than said sensed temperature, so that the circulation of said heat transfer fluid past said low temperature heat exchanger is increased in response to an increasing difference between said sensed temperature and said desired temperature,

wherein said means for regulating said circulation of said fluid past said low temperature heat exchanger comprises a mixing valve selectively bypassing the circulation of said fluid past the low temperature heat exchanger and a servomotor adjusting said mixing valve in response to said cooling control signal, and

wherein said means for generating a cooling control signal includes means for generating a rate function and means for generating a nonlinear gain characteristic, and said means for selectively energizing said heater is responsive to said means for generating a rate function.

4,547,978

FOOTWEAR

Alfred D. Radford, Combe, Near Langport, England, assignor to Clarks Limited, Street, England

Filed Jan. 27, 1983, Ser. No. 461,626

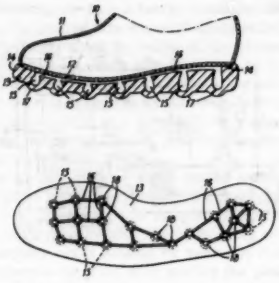
Claims priority, application United Kingdom, Feb. 5, 1982, 8203357

Int. Cl.[4] A43B *7/06*

U.S. Cl. 36—3 B **11 Claims**

1. A sole unit for an article of footwear, which sole unit is

formed in one piece from a resilient moldable material, comprising: a sole portion and a heel portion molded integrally with each other and having top and bottom surfaces, a plurality of cavities formed in each of said portions, a system of channels formed in the top surface of said portions, each of said cavities having a restricted opening through which the cavity



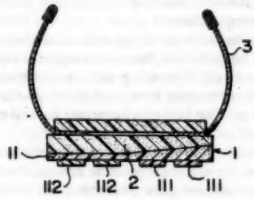
is individually in communication with the system of channels, a bulge formed on the bottom surface below each of said cavities wherein the cross-sectional area of said restricted opening is substantially one-quarter of the maximum cross-sectional area of the cavity, and wherein the maximum diameter of the cavities is in the range 8 to 12 mm.

4,547,979

ATHLETIC SHOE SOLE

Masasuke Harada, and Yoshiharu Moronaga, both of Kurume, Japan, assignors to Nippon Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,144
Claims priority, application Japan, Jun. 20, 1983, 58-111583
Int. Cl.[4] A43B *13/12, 13/14, 13/04, 13/26*
U.S. Cl. 36—30 R **1 Claim**



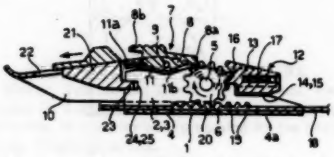
1. An athletic shoe sole comprising an outersole including an outersole body progressively increasing in thickness toward the inside edge of the sole at least on an inner side of a longitudinal midline axis of a heel portion of the outersole body, a plurality of projections harder than the outersole body secured to the lower surface of the heel portion on the inner side and a plurality of projections softer than the outersole body secured to the remaining area of the outersole body, and a cushioning midsole overlaid on said outersole body and progressively decreasing in thickness toward the inside edge of the sole on an inner side of a longitudinal midline axis of a heel portion of the midsole complementary to the thickness of the outersole body.

4,547,980

SPROCKET DEVICE FOR THE FASTENING OF SKI-BOOTS

Oliviero Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C.S.p.A., Montebelluna, Italy

Filed Apr. 18, 1983, Ser. No. 485,907
Claims priority, application Italy, Jun. 1, 1982, 22038/82[U]
Int. Cl.[4] A43C *11/00;* **A43B** *11/00*
U.S. Cl. 36—50 **2 Claims**



1. A device for fastening ski-boots and permitting a fine adjustment in the tightness of the fastening operation, wherein the device comprises:

a support plate provided with flanges along the opposite sides thereof, whereby the support plate has a substantially U-shaped cross-section;

a pin supported by said opposing flanges;

a sprocket rotatably mounted on the pin;

a tie constituted by a flexible strap having at least one portion thereof provided with a plurality of transverse teeth engageable by the sprocket;

a ratchet mechanism for advancing the sprocket relative to said teeth to tension the tie;

a lever for operating the ratchet mechanism, said lever being pivoted on said pin,

a ratchet mechanism for locking the sprocket to maintain the tension of the tie;

a slot defined by said lever and a slider movable into and out of said slot;

respective slots formed in the flanges of the support plate, and a projecting tab formed on the slider for engagement with the slots of the flanges to lock the lever.

4,547,981

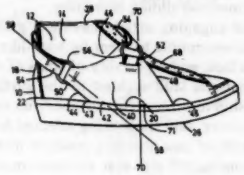
SHOE WITH ANKLE PROTECTOR

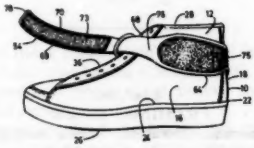
William Thais, Rte. 2, Box 2, Dwight, Ill. 60420, and William Kauth, 417 Bradley La., Normal, Ill. 61761

Filed Apr. 27, 1984, Ser. No. 604,674
Int. Cl.[4] A43B *7/20, 5/00*
U.S. Cl. 36—89 **16 Claims**

1. A shoe with ankle protector comprising a sole, an inwardly facing shoe side wall having a bottom edge secured to said sole, an outwardly facing shoe side wall having a bottom edge secured to said sole, a first location point on said outwardly facing shoe side wall along its bottom edge adjacent the mid-heel region of a wearer's foot, a second location point on said outwardly facing shoe side wall along its bottom edge adjacent the distal joint of the fifth metatarsal of a said wearer's foot, a first connecting point associated with said shoe adjacent said outwardly facing side located between said first and second location points and nearer said first location point, a second connecting point associated with said shoe located between said first and second location points and nearer said second location point, said ankle protector including a strap member of flexible inelastic material extending upwardly from said first connecting point along said outwardly facing shoe side wall in angular alignment with said first location point, a rear portion of said strap member extending across from said outwardly facing shoe side wall to said inwardly facing shoe side wall, a portion of said strap member extending adjacent said inwardly facing shoe side wall in facing abutting relationship therewith and adjacent the inwardly facing side of the

ankle bone of said wearer's foot in facing relationship therewith, said portion of said strap which lies adjacent to and in facing relationship with said ankle bone having a width broad enough to extend above and below that part of said shoe which lies adjacent to said wearer's ankle bone, said ankle bone being





the medial malleolus of the tibia portion of said wearer's ankle, and a continuing front portion of said strap member extending across a front portion of said wearer's foot and downwardly to said second connecting point along said outwardly facing shoe side wall.

4,547,982

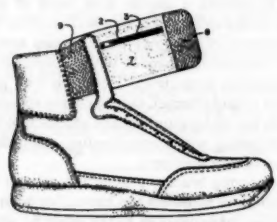
WRAPAROUND POCKET FOR FOOTWEAR

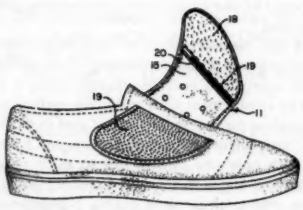
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 436,342, Oct. 25, 1982, abandoned, and Ser. No. 190,791, Sep. 25, 1980, abandoned. This application Jan. 19, 1983, Ser. No. 459,106

Int. Cl.⁴ A43B *5/00*

U.S. Cl. 36—114 **12 Claims**





1. In a pocket for footwear and designed to wrap around the upper fastening area of the footwear to partially conceal the same and to add support for the footwear when applied upon the foot of the wearer at such underlying location, said footwear being of the type having a vamp, a pair of quarter and heel portions all securing together and being integrally connected with the shoe sole, said pocket secured at said upper fastening area intermediate the quarter portions for aiding in the retention of the footwear upon the foot, the improvement which comprises, a wraparound pocket means secured at one side edge with the approximate upper edge of one quarter portion for the footwear, and being disposed for wrapping around the upper fastening means for the footwear, said pocket means approximately at its other side edge normally fastening with the approximate upper edge of the other quarter portion for the footwear, at least the fastening of said other side edge with the said proximate upper edge of the other quarter portion of the said footwear being releasable, said pocket means including a pair of liners, one of said liners being an outer liner, the other said liner being an inner liner, and said liners being substantially secured together at their edges to form an enclosed pocket, an access slot provided to furnish access into the formed pocket, and a closure means provided for closing of the said pocket access slot.

4,547,983

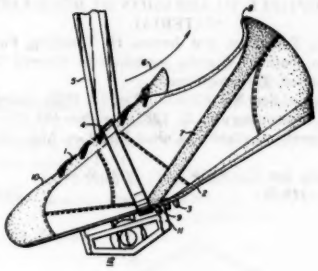
BICYCLE SHOE

Jobst Brandt, Palo Alto, Calif., assignor to Bernhard Hoffacker, Woodside and Neal Hoffacker, Portola Valley, both of, Calif.

Filed Feb. 18, 1983, Ser. No. 467,827

Int. Cl.⁴ A43B *5/14*

U.S. Cl. 36—131 **7 Claims**



1. In a shoe primarily adapted for use in bicycling, the improvement comprising a substantially non-elastic strap extending from a location proximate the upper heel of the shoe and extending substantially to the sole of the shoe at a location proximate the area of said shoe corresponding to the ball of the cyclist's foot, said strap further being anchored to said shoe at the region of said sole which is located above the pedal of the bicycle when the shoe is placed onto the bicycle pedal.

4,547,984

BRUSH UPROOTING ATTACHMENT

Robert D. Adams, R. 2, Box 144, Kalona, Iowa 52247

Filed Mar. 27, 1984, Ser. No. 593,913

Int. Cl.⁴ A01B *39/12*

U.S. Cl. 37—2 R **1 Claim**

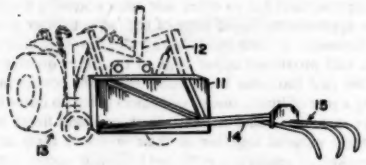
1. A brush uprooting attachment comprising:

an elongated tool bar having a claw-like tool secured to one end thereof and mounting frame means secured to the other end thereof,

said claw-like tool comprising a plurality of slender strong tines extending beyond said one end of said elongated tool bar,

each of said tines having a secured end secured to said one end of said elongated tool bar, a straight portion extending outward from said secured end beyond said one end of

said elongated tool bar and a curved portion continuing outward, downward, and then inward to terminate in pointed ends, said straight portions diverging in an outward direction from said one end of said elongated tool bar and said curved portions having a rate of curvature to facilitate enmeshing said pointed ends about roots of brush to be uprooted, said pointed ends being directed substantially toward said mounting frame means,



said mounting frame means adapted to be coupled to a power lift of a tractor for extending said elongated tool bar longitudinally therefrom, and said power lift to be operated to lower and to raise said claw-like tool during back and forth movement of said tractor to enmesh said pointed ends among roots of brush and to remove said brush.

4,547,985

METHOD OF PROTECTING A METALLIC SURFACE SUSCEPTIBLE TO ABRASION BY ROCK-LIKE MATERIAL

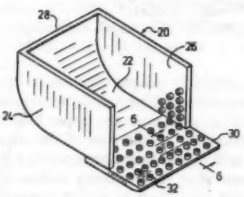
Vilnis Silins, Edmonton, and Jerome H. Tameling, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation of Ser. No. 128,433, Mar. 10, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,226

Claims priority, application United Kingdom, Mar. 20, 1979, 79 09826

Int. Cl.⁴ E02F *3/00, 7/00, 9/28*

U.S. Cl. 37—118 R **21 Claims**



1. A method of protecting a ground engaging metallic surface of a ground engaging tool susceptible to wear by rock-like material sliding over the surface comprising providing studs of abrasion resistant metallic material selected from the group consisting of studs of cast abrasion resistant metallic material and studs of compacted abrasion resistant metallic material powder, and stud welding said studs to the surface to protect the surface from such wear.

9. A discharge chute for conveying rock-like material from one height to a lower height, said chute having an upper surface over which the rock-like material passes, and a series of studs of abrasion resistant metallic material stud welded to the said surface in closely spaced relationship to protect the surface from wear by rock-like material sliding thereover, said studs being selected from the group consisting of studs of cast abrasion resistant metallic material and studs of compacted abrasion resistant metallic material powder.

13. A ground engaging tool comprising a metallic body with a base, side walls extending upwardly from opposite sides of the base, and a rear wall extending upwardly from the rear of the base between the side walls, and at least one of the ground-engaging surfaces of the base and side walls having a series of studs of abrasion resistant metallic material stud welded thereto in closely spaced relationship to protect the surface from rock-like material sliding thereover.

18. A ground engaging article having a ground engaging metallic surface susceptible to wear by rock-like material sliding over the surface, and a plurality of studs of abrasion resistant metallic material stud welded to the surface in closely spaced relationship to protect the surface from rock-like material sliding thereover, said studs being selected from the group consisting of studs of cast abrasion resistant metallic material and studs of compacted abrasion resistant metallic material powder.

4,547,986

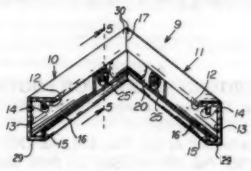
FRAMING SYSTEM

Charles F. Sherman, Townsend, Mass., assignor to Nielsen Moulding Design Corp., Townsend, Mass.

Filed Dec. 27, 1982, Ser. No. 453,511

Int. Cl.⁴ A47G *1/06*

U.S. Cl. 40—155 **18 Claims**



1. A framing system comprising:

a plurality of elongated frame members having mitered ends joined to enclose a display area, each of said members having an inwardly projecting wall portion for enclosing the perimeter of a display piece in said area and a rearwardly projecting channel with transversely extending lips projecting respectively from said wall portion and a rear wall of said channel, said lips being spaced apart by an inwardly facing longitudinal slot and each of said channels communicating with corresponding channels in contiguous ones of said members;

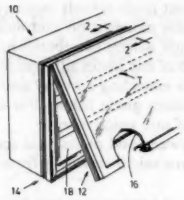
a unitary securing bracket joining the ends of each pair of said contiguous members and having leg portions disposed at an angle corresponding to the angle between said contiguous members and retained by said channels therein, each of said leg portions comprising a retainer cavity juxtaposed to one of said slots and defining guide surface means; and

a locking cam means retained by each of said cavities, each said locking cam means comprising a base portion retained by said cavity and movable therein along a path determined by engagement with said guide surface means and a latch portion extending into one of said slots and movable by said movement of said base portion into forced engagement with only one of said lips so as to securely latch together said frame member and said leg portion retained thereby, said latch portions during engagement with said one engaged lip producing between said frame members and said leg portions opposing longitudinal forces directed along the longitudinal axes thereof so as to draw together said joined ends.

4,547,987
SIGN STRUCTURE

Johann Stilling, 1141 Royal York Rd., Apt. A1001, Islington, Ontario, Canada (M9A 4A9)

Continuation-in-part of Ser. No. 458,771, Jan. 18, 1983, Pat. No. 4,516,343. This application Apr. 11, 1984, Ser. No. 598,981
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—574 13 Claims



1. A face frame construction for use in association with a sign box of the type having a hinge recess, said face frame being adapted to support a thin flexible sign face material thereon, and comprising:

a generally rectangular frame having two end members, and top and bottom members, joining one another at corners, each said member having outer walls, said rectangular frame defining an inner zone and an outer zone;

face panel supporting means connected with said outer wall and having a continuous forwardly extending cantilever member defining a rim around said face frame for supporting such thin flexible material therein, said rim defining a foward edge;

a hinge formation connected to said outer wall along said top member at least, and extending in a rearward direction for hinging interengagement with said hinge recess aforesaid;

holder means for engaging edges of said thin flexible material and comprising at least one generally elongated channel formation, having side walls, and a generally curved bottom wall, defining a generally U-shaped cavity, with a reduced width open mouth portion, and a generally outwardly angled lip portion adjacent said reduced width mouth portion, whereby said flexible material may be formed around one of said outwardly angled lip formations; anchoring means whereby said flexible material may be secured within said cavity;

a recess defined by said face panel supporting means adapted to receive said holder means, and,

fastening means adapted to extend from said holder means and openings in said frame, for receiving said fastening means whereby said holder means may be adjustably tightened up, thereby tensioning said material around said rim.

4,547,988
FIREARM SYSTEM WITH CYLINDER BOLT MECHANISM

Lennart C. O. Nilsson, Armfeldtsvägen 9, S-670 40 Åmotfors, Sweden

PCT No. PCT/SE81/00368, § 371 Date Jun. 17, 1983, § 102(e) Date Jun. 17, 1983, PCT Pub. No. WO83/02153, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 11, 1981, Ser. No. 514,815
Int. Cl.[4] F41C *11/00, 21/12*
U.S. Cl. 42—16 11 Claims

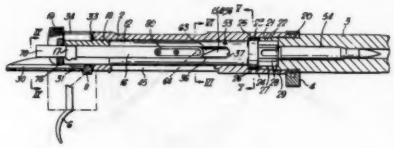
11. The combination of a barrel and a cylinder bolt mechanism for use in a firearm comprising a stock and said combination, said mechanism comprising a bolt having a front region and a receiver having a front end and a rear end, a cartridge chamber, having a front end and a rear end, in said barrel, said barrel securely screwable into the front end of the receiver so that the rear end of the cartridge chamber is spaced from the rear end of the barrel and defines a space therebetween,

a locking chamber in said space,

a rotatable bolt tip on said bolt, said locking chamber receiving said bolt tip,

a first stop located on the rear end of the barrel, a second stop located in the receiver rearward of the barrel,

a locking ring located rearward of the locking chamber and between said first stop and said second stop,



male means and female means for preventing said locking ring from rotating with the bolt tip, said male means at the front region of the bolt body, said female means being of matching shape and located in said locking ring, said male means introduced into the female means upon forward movement of the bolt after the bolt tip has passed all the way through said locking ring.

4,547,989
CATCHING HOOK

Bengt Karlsson, Sjövägen 1, S-136 49 Handen, Sweden

PCT No. PCT/SE83/00361, § 371 Date Jun. 22, 1984, § 102(e) Date Jun. 22, 1984, PCT Pub. No. WO84/01488, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 24, 1983, Ser. No. 624,681
Claims priority, application Sweden, Oct. 22, 1982, 8206007
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 6 Claims

1. Catching hook comprising two straight portions which are arranged for displaceable movement relative to one another between a catching position when the portions are in extended relationship, to a transport position when the straight portions are pushed together, one of said straight portions being in one end provided with a hook and the other straight portion being provided with a handle at the end opposite to the hook, characterized in that the hook is rotatably connected with the end of the first straight portion, and that locking means are arranged to prevent rotational movement of the hook when used in catching position, and after release of said locking means permit its rotation to a weighing position, and that the handle is rotatably connected to a supporting device which is slidingly displaceable on a corresponding one of said straight portions, said handle being pivotably connected to said supporting device and after release from the end of the corresponding straight portion, being swingable to a weighing position, and that a counterweight is attachable to the end of the handle portion, whereby the catching hook can be used as balance scale which is carried by means of the outwardly swung handle.

4,547,990
FISHING APPLIANCE

Richard A. Hero, Mesa, Ariz., assignor to D G & Associates, Inc., Scottsdale, Ariz.

Filed Nov. 7, 1983, Ser. No. 548,991
Int. Cl.[4] A01K 97/00
U.S. Cl. 43—15 6 Claims

1. A fishing appliance for operative interposition in a fish line extending between a fishing rod and a bait comprising; a main stem having a cylindrical body portion, said body portion having a first and second end portion disposed at each end thereof, said first end portion having a first and second opening defined therethrough, said first opening adapted to secure a fishing line to said main stem, said second opening adapted to secure a coil spring to said stem in circumscription thereabout, said second end portion having a notch formed therein adapted to receive and hold a trigger member therein when said spring is in its loading condition; means for securing said first opening in said main stem to a first portion of the fish line; said coil spring secured to said second opening in said main stem and extending along said main stem in circumscription thereabout; and said trigger member having a first arm portion and a second arm portion joined at an elbow to form an interior angle therebetween, said first arm portion being connected to the unsecured end of said coil spring, said second arm portion being connected to the second portion of the fish line, said trigger member coacting with said main stem to load said coil spring thereupon and retain said load until a force upon said second portion of said fish line disengages said trigger from said stem and permits said spring to recoil.

4,547,991
FISHING LINE SYSTEM

Albert P. Searcy, 18015 Cantara St., Los Angeles, Calif. 91335

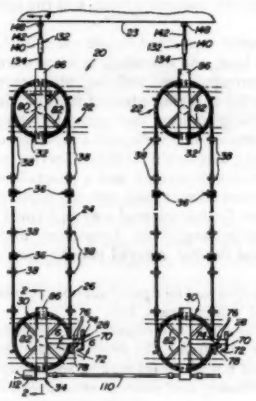
Filed Mar. 26, 1984, Ser. No. 593,523
Int. Cl.[4] A01K 87/00
U.S. Cl. 43—18.1 2 Claims

1. A fishing line system comprising:
a mounting member for attachment to a fishing rod;
a front pivot pin and a rear pivot pin, said pivot pins being spaced from each other and having their axes fixedly positioned with respect to said mounting member;
right and left front guide wheels mounted on said front pivot pin so that said guide wheels are rotatably mounted with respect to said mounting member, said front right and left guide wheels being axially spaced with respect to each other;
right and left rear guide wheels mounted on said rear pivot pin so that each of said rear guide wheels is rotatably mounted with respect to said mounting member, said right and left rear guide wheels being axially positioned with respect to each other along the length of said rear pivot pin, each of said guide wheels having a surface of revolution thereon around its respective axis of rotation with said surfaces of revolution being such as to guide fishing line therearound so that fishing line can extend successively around said front and rear guide wheels;
right and left front plates mounted on said mounting member with said front guide wheels therebetween, and right and left rear plates mounted on said mounting member with said rear guide wheels therebetween;
a recess in each of said plates adjacent said guide wheels, said guide wheels extending partway into said recesses so that said guide plates guide fishing line onto said surfaces of revolution of said guide wheels;
spacer pins between said plates, said spacer pins being positioned between said plates away from said mounting member; and
at least one of said spacer pins being provided with a guide roller thereon so that fishing line is guided by said guide roller onto one of said guide wheels.

4,547,992
APPARATUS FOR CARRYING PLURAL PLANTS TO A WATERING STATION

Arie V. Wingerden, R.R. #1, Box 37A, Pipersville, Pa. 18947

Filed Mar. 16, 1984, Ser. No. 590,404
Int. Cl.[4] A01G 9/00
U.S. Cl. 47—17 22 Claims



1. Apparatus for carrying plural plants to a watering station comprising endless conveyor means, support means for supporting said conveyor means, drive means for causing said conveyor means to be circulated past said watering station, plural hanger means mounted at spaced locations on said conveyor means for movement therewith, each of said hanger means being pivotally connected to said cable, each of said hanger means being arranged to assume either a first orientation or a second orientation with respect to said conveyor means, each of said hanger means being arranged to support a plant thereon, with each of said hanger means being in said first orientation when a plant is supported thereon and being configured to automatically assume said second orientation when a plant is not supported thereon, and sensing means located at said watering station for coacting with said hanger means when said hanger means is in said first orientation, and wherein when said hanger means does not support a plant, it will move to said second orientation so that said watering means will not be actuated, and wherein when said hanger means is in said first orientation, the watering means at said watering station

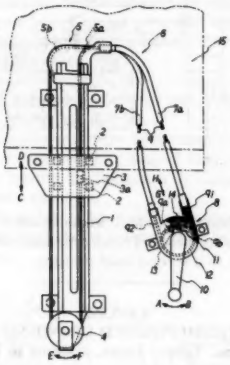
effecting the watering of the plant carried by said hanger means.

4,547,993

WINDOW REGULATOR

Tetuo Kobayashi, Ikeda, and Syoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System, Inc., Hygo, Japan

Continuation of Ser. No. 275,148, Jun. 19, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,384
Claims priority, application Japan, Feb. 27, 1981, 56-28256
Int. Cl.⁴ E05F *11/48*
U.S. Cl. 49—352 **3 Claims**



1. A unitary regulator employing a control cable as a transmission means, comprising

a control cable including an inner cable and two flexible conduits;

at least one rigid guide rail having opposite ends;

a bracket having a slide shoe which is slideable along the guide rail in connection with winding operation of the inner cable and securable to a window glass;

a pulley rotatably provided to one end of the guide rail, the inner cable being slideably engaged with the pulley;

an L-shaped curved cable guide having two ends at a right angle to each other, one end being secured to the other end of the guide rail, a curved first open guide groove and a curved second open guide groove being formed on the cable guide extending from one end to the other end, the inner cable being guided along the guide grooves and deflected at an angle away from a longitudinal axis of said guide rail,

the two conduits of the control cable being rigidly secured to the other end of the cable guide, one end of one of the conduits communicating with the first guide groove and one end of the other conduit communicating with the second guide groove, the inner cable extending through the conduits; and

an operating means for performing simultaneously winding-up and winding-off actions of both end portions of the inner cable, the other end of each of the conduits being rigidly secured to the operating means thereby enabling tension of the inner cable set before installation to be maintained during installation of said window regulator;

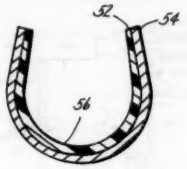
the operating means, the inner cable, the conduits, the cable guide, the guide rail and the pulley being preformed as a unitary structure having a generally inverse-J shape prior to installation in a door panel of a vehicle, and the window glass subsequent to installation being movable along the guide rail in response to the winding-up and winding-off actions of both end portions of the inner cable in the operating means.

4,547,994

METAL AND PLASTIC EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Dec. 13, 1983, Ser. No. 561,247
Int. Cl.⁴ E05F *7/00*
U.S. Cl. 49—462 **4 Claims**



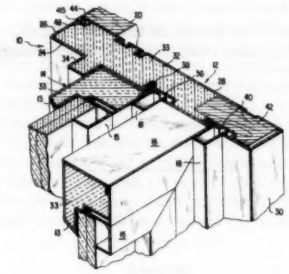
1. A method of making an edge guard of generally U-shaped cross section having inner and outer legs joined by a generally semi-circular base which comprises passing a flat metal strip through an extruder, extruding plastic onto said strip as it passes through the extruder such that the plastic is applied to produce a tapered cross sectional shape on one face of the strip which is thicker at a central region and narrows toward the side edges of the strip and then forming the strip into the U-shaped cross section such that the taper of the plastic narrows in a direction toward the distal end of each leg and the plastic is disposed on the interior of the U-shaped cross section.

4,547,995

REMOVABLE SASH GUIDE FOR WINDOW FRAMES

Eugene R. Tippmann, Fort Wayne, Ind., assignor to Lakeview Window Corporation, Fort Wayne, Ind.

Filed Sep. 30, 1983, Ser. No. 537,848
Int. Cl.⁴ E05D *15/00*
U.S. Cl. 49—457 **6 Claims**



4. A window construction of the type having two sliding sashes comprising:

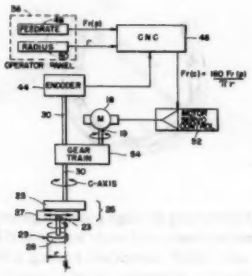
(1) a frame consisting of horizontal and upright members to which said sashes are fitted, said upright members each having at least one channel extending the length thereof with an opening formed therein,

(2) a guide strip positioned in each of said channels and extending through said opening to maintain said sliding sashes in alignment in said frame, said guide strip having a pair of parallel, spaced-apart legs connected at one end thereof by an intermediate portion, a latching means on the other ends of said legs for maintaining said legs in said opening, and cooperating means for preventing said legs from being removed from said opening when one of said legs is moved by force toward said other of said legs.

4,547,996
JIG GRINDER WITH AUTOMATIC C-AXIS FEEDRATE CONTROL

Dennis A. Winski, Fairfield, Conn., assignor to Moore Special Tool Co., Inc., Bridgeport, Conn.

Filed Apr. 26, 1984, Ser. No. 604,064
Int. Cl.[4] B24B *51/00*
U.S. Cl. 51—165.71 **6 Claims**



1. A method for grinding straight surfaces and adjoining arcs at a constant feedrate without interruption comprising the steps of:

coupling a grinding wheel to a spindle of a jig grinder;

offsetting said grinding wheel from a center axis of said spindle to establish a radius "r" from the spindle axis to a cutting edge of said grinding wheel;

mounting a workpiece to be machined to a worktable;

moving said worktable at a preset feedrate "Fr(p)" along a straight path to effect grinding of a straight surface on said workpiece by said grinding wheel;

computing, as a function of the established radius "r" and said preset feedrate "Fr(p)", a rotational speed for rotating said spindle to provide a uniform surface speed at the cutting edge of said grinding wheel as said wheel traverses said workpiece from a straight surface to an arc being ground; and

stopping the work table and similtaneously rotating said spindle at the computed rotational speed when grinding an arc.

4,547,997
ADJUSTABLE TOOL MOUNT

Rudolf J. A. Kimmelaar, Vlaardingen, and Cornelis A. Smits, Meerkerk, both of Netherlands, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 11, 1984, Ser. No. 609,309
Int. Cl.[4] B24B *41/04*
U.S. Cl. 51—168 **4 Claims**

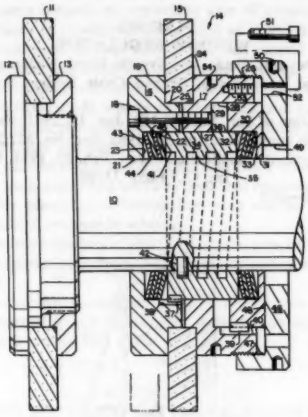
1. An adjustable tool mount for positioning a rotatable tool on a machine spindle, comprising:

(a) a tool holder, having a bore cooperatingly formed to a sliding fit with said machine spindle;

(b) an internal groove in said bore, said groove having an axial lead;

(c) a pin fixed in said spindle and extending radially therefrom into said groove;

(d) means for releasably clamping said tool holder in a fixed position relative to said spindle; and

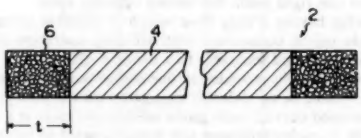


(e) means for rotating said tool holder relative to said spindle, thereby adjusting said tool holder on said spindle from a first axial position to a second axial position.

4,547,998
ELECTRODEPOSITED GRINDING TOOL

Keiichi Kajiyama, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,374
Claims priority, application Japan, Oct. 7, 1983, 58-187009
Int. Cl.[4] B24D *7/22*
U.S. Cl. 51—206 R **24 Claims**



1. An electrodeposited grinding tool having an abrasive layer formed by electrodepositing abrasive grains to an electrodeposition thickness at least three times as large as the diameter of the abrasive grains, said abrasive layer having pores dispersed therein in a volume ratio of 10 to 70%.

4,547,999
DEVICE FOR FIXING A DRILL TO BE GROUND

Karl Reiling, Pforzheimer Strasse 28, and Reinhold Reiling, Gründeltorstrasse 9, both of D-7539 Kämpfelbach-Ersingen, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,297
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146664
Int. Cl.[4] B24B *3/26*
U.S. Cl. 51—219 R **1 Claim**

1. In a fixed device for fixing a drill having cutting edges which are to be ground by a grindstone face, said fixing device comprising

a baseplate;

a stand mounted on and extending above said baseplate;

a pivot pin mounted on said stand and extending above said baseplate transversely to the vertical direction; and

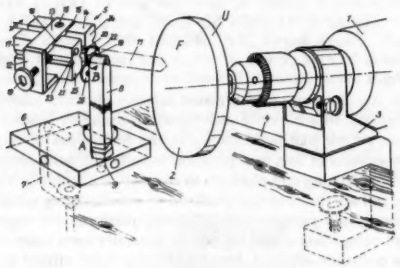
a gripping device which is slidably fitted on said pivot pin and adapted to grip a drill which is to be ground, said gripping device comprising an elongated retaining member and two prismatic members which are carried by said retaining member and extend transversely thereto and are slidable relative to each other, each of said prismatic members having mutually opposite end faces formed with respective blind bores, each of which is adapted to slidably receive said pivot pin, said prismatic members being adapted to receive between them a drill to be ground, said gripping device also comprising a thrust screw, which is carried by said retaining member and operable to engage one of said prismatic members on the side which is opposite to the other of said prismatic members and to force said one prismatic member toward the other and against a drill disposed between said prismatic members so as to grip said drill and to fix said prismatic members in position relative to each other,

the improvement residing in that

said retaining member is U-shaped and comprises two legs and a web connecting said legs,

said two prismatic members have confronting side faces formed with registering V-shaped longitudinal grooves adapted to receive portions of a drill disposed between said prismatic members,

said prismatic members have mutually opposite side faces formed with grooves for receiving said legs of said retaining member,



said prismatic members have side faces which are opposite to said confronting side faces and formed with V-shaped longitudinal grooves differing in cross-section from said longitudinal grooves in said confronting side faces,

said one prismatic member being an inner member which is disposed between said web and said other prismatic member, which is an outer member,

said legs of said retaining member carry screw means by which said outer prismatic member is secured to said legs, and

said thrust screw is in screw-threaded engagement with said web and in engagement with said inner member to make it shiftable toward said outer member to clamp said drill,

said prismatic members are adapted to be mounted in said retaining member and on said pivot pin in such a manner that said opposite side faces face each other and said longitudinal grooves therein register with each other so that said prismatic members are adapted to grip between them drills differing in diameter, and

an adjustable stop member is carried by and in screw-threaded engagement with said stand and extends parallel to said pivot pin and is engageable by the end faces of said prismatic members to limit the movement thereof axially along said pivot pin, whereby the limited rotation of said retainer member about said pivot pin, as determined by the movement of the drill with respect to the stand, defines an orbital path along which the cutting edges of the drill will move across the grindstone face.

4,548,000

METHOD FOR PRODUCING THREADED SECTIONS OF THREADING TOOLS

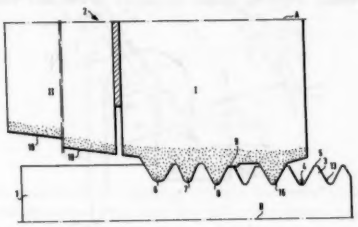
Erwin Junker, Talstrasse 78, D 7611 Nordrach-Baden, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 564,079

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1983, 3305034

Int. Cl.[4] B24B *3/18, 5/04*

U.S. Cl. 51—288 **3 Claims**



1. A method for forming the threaded portion of a threading tool such as a tap drill, said method comprising:

providing a tool blank having a first longitudinal axis and longitudinal grooves spaced circumferentially between longitudinal areas to be threaded

mounting said tool blank for rotation about said longitudinal axis thereof;

providing a grinding tool including a first grinding wheel having extending from the periphery thereof a plurality of integral grinding ribs and a second grinding wheel having a smooth peripheral surface;

mounting said first and second grinding wheels integrally for rotation about a common second longitudinal axis parallel to said first longitudinal axis;

at a first spacing between said first and second longitudinal axes, rotating said tool blank and said grinding tool about respective said longitudinal axes, while imparting relative axial movement between said tool blank and said grinding tool, and thereby grinding into said longitudinal areas of said tool blank and forming threads therein by said ribs of said first grinding wheel, while maintaining said peripheral surface of said second grinding wheel out of contact with said tool blank; and

moving said first and second longitudinal axes closer to each other than said first spacing while bringing said peripheral surface of said second grinding wheel into contact with said threads at an end portion of said tool blank, and thereby grinding away outer portions of said threads at said end portion to form a tapered end of said tool.

4,548,001

CLEANING APPARATUS AND METHOD

John Link, 188 Bay St., Port Melbourne 3207, Victoria, Australia

Filed May 18, 1981, Ser. No. 264,393

Claims priority, application United Kingdom, May 16, 1980, 8016253

Int. Cl.[4] B24C *7/00*

U.S. Cl. 51—410 **5 Claims**

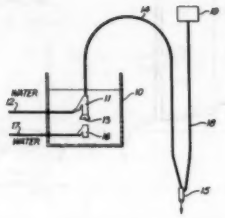
1. Cleaning apparatus employing an abrasive laden water jet, for abrasive cleaning of structures such as legs of oil rigs which are spaced from sources of abrasive and energy, such apparatus including:

(a) a tank to contain a mixture of water and abrasive,

(b) an eductor in said tank, said eductor having first and second inlets and an outlet,

(c) a water supply connected to said first inlet of said eductor,

(d) said second inlet of said eductor being open to the water abrasive mixture,
(e) means to fluidize the abrasive in the water in the tank,
(f) a source of high pressure fluid,
(g) a remote working nozzle having first and second inlets leading to an outlet, said remote working nozzle being remote both from said tank and said source of high pressure fluid,
(h) a first line leading from the outlet of said eductor, said first line extending from said tank to said first inlet of said remote working nozzle to supply in use said water and



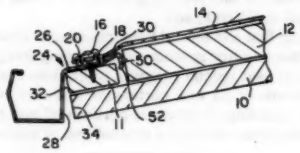
abrasive mixture to said remote working nozzle by the action of said water supply in said eductor,
(i) a second line leading from said source of high pressure fluid to said second inlet of said remote working nozzle to supply, in use, high pressure fluid to said remote working nozzle,
whereby, in use, said water and abrasive mixture travels from said tank to said remote working nozzle at relatively low pressure to reduce wear in said first line and is accelerated in said remote working nozzle by said high pressure fluid which travels to said nozzle without entrained abrasive.

4,548,002

ROOF FOR A MOBILE HOME OR THE LIKE

John E. Murray, 2581 SE. 13 St., Pompano Beach, Fla. 33062

Filed Sep. 29, 1982, Ser. No. 427,627
Int. Cl.⁴ E04B *7/00*
U.S. Cl. 52—22 **18 Claims**



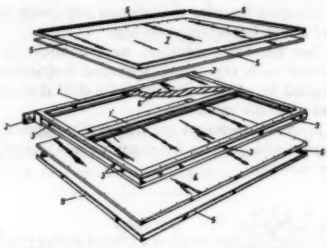
1. A roof for a mobile home or the like comprising in combination:
an existing roof having a peripheral edge;
peripheral blocks disposed along the entire peripheral edge of said existing roof;
insulative material overlying said existing roof;
said insulative material being encompassed by said peripheral blocks;
marginal flashing of impervious material extending completely over said peripheral blocks;
said marginal flashing including a first and a second limb;
an upstanding portion extending from the distal end of said first limb away from said existing roof;
supplementary roof sheets of impervious material overlying the entire area of said insulative material and said upstanding portion, said supplementary roof sheet also overlying said first limb;
said upstanding portion and said supplementary roof sheets cooperating to prevent the egress of driven rain therebetween towards said insulative material; and
means for securing said first limb between said supplementary roof sheets and said peripheral blocks.

4,548,003

PREFABRICATED BALCONY PLATFORM

Kurt A. Johansson, Strömstad, and John-Eric Marcusson, Handen, both of Sweden, assignors to Alnova Bygg Aktiebolag, Stromstad, Sweden

Filed Mar. 8, 1983, Ser. No. 473,330
Claims priority, application Sweden, Mar. 16, 1982, 8201641; Dec. 28, 1982, 8207434
Int. Cl.⁴ E04B *1/34*
U.S. Cl. 52—73 **4 Claims**



1. An improved prefabricated balcony platform adapted to be affixed to a building wall between vertically spaced windows or the like for assisting in the prevention of upward transmission of fire, said platform including attachment members for affixing said platform to the wall of a building, a parapet, and apertures in said platform to pass fastening means for securing said parapet to said balcony platform, the improvement comprising a load-supported generally open beam frame of a corrosion-resistant, heat conductive metal affixed to said attachment members, a bottom slab of refractory material detachably attached to the lower face of said beam frame and in heat transfer relation therewith, a top slab attached to the upper face of said beam frame in heat transfer relation thereto and consisting of a material having high heat-transfer properties, and an intermediate layer of sound-proof refractory material positioned in the opening of said beam frame and interposed between said top and bottom layers.

4,548,004

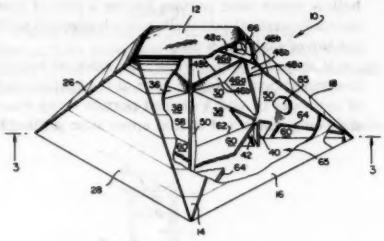
SPACE FRAME CONSTRUCTION WITH MUTUALLY DEPENDENT SURFACES

Lemuel J. Chastain, Mountain Rest, S.C. 29664

Filed Aug. 8, 1983, Ser. No. 521,158
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—81 **9 Claims**

1. A space frame construction with at least two mutually dependent surfaces comprising at least one multifaceted surface formed by a plurality of rigid panel members approximating a tessellation of a generating curved surface and defining a first polyhedron normally projected above the generating curved surface, said first polyhedron enclosing an open space thereunder, a second complementary multifaceted surface formed by a plurality of rigid panel members approximating another generating curved surface and defining a second polyhedron in duality with the first polyhedron, with the rigid

panel members of each of said polyhedra being disjoined and intraspacial means in mutual contact with the first and second



polyhedra for providing structural interconnection to support the space frame.

4,548,005

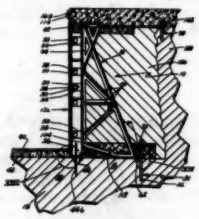
STRUCTURAL FOAM SWIMMING POOL WALL AND BRACE AND METHOD OF ERECTING SAME

Robert L. Glonek, 3256 Rickman, NE., Grand Rapids, Mich. 49505; Paul Kantor, and Loren R. Perry, both of Berrien Springs, Mich., assignors to Robert L. Glonek, Grand Rapids, Mich.

Division of Ser. No. 312,349, Oct. 16, 1981, Pat. No. 4,464,802. This application Feb. 21, 1984, Ser. No. 581,580

Int. Cl.⁴ E04H *3/18, 3/16;* **E01C** *7/00;* **E04G** *17/00*

U.S. Cl. 52—155 **12 Claims**



5. A method for plumbing and leveling pool walls secured to supporting braces comprising:

providing a brace having an aperture therethrough through which a stake can be placed and driven into the ground;

securing said brace to a pool wall;

providing an anchor assembly including a stake having a cross section smaller than said aperture in said brace and wedge means slideably mounted in said stake, said wedge means being wider at the top than bottom and projecting laterally from said stake;

placing in said aperture said stake, whereby said stake slidingly fits within said aperture;

driving said stake into the ground;

plumbing and leveling said wall; and

moving said wedge means down said stake, whereby said wedge means evenutally engages said brace at the side of said aperture and wedges said stake and wedge means combination against the side of said aperture to bind said anchor assembly to said brace.

4,548,006

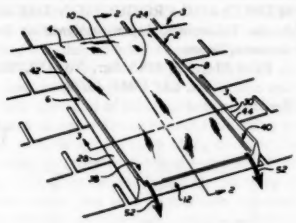
SELF-FLASHING CHANNELED SKYLIGHT

Joseph W. Roberts, Sr., 413 Virginia Dr., Orlando, Fla. 32803

Filed Sep. 13, 1984, Ser. No. 650,582

Int. Cl.⁴ E04B *7/18*

U.S. Cl. 52—200 **4 Claims**



1. An improved self-flashing skylight for installation on a downwardly sloped roof, said skylight comprising a generally rectangular, light-transmissive member having two mutually opposed side edges and opposed top and bottom edges and a convexly curved central portion extending between these edges and having flange portions extending outwardly from each of the four edges to define a base plane of the skylight, with said side edges and said bottom edge each having a generally upwardly extending wall portion interposed between the respective said flange portion and said convexly curved central portion, with said side edge wall portions each extending above the level of the adjacent outermost part of said convexly curved portion to form a concave channel where each said wall portion joins said convexly curved central portion.

4,548,007

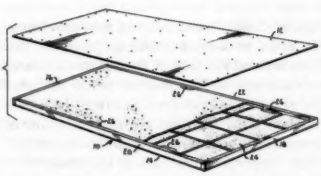
BUILDING PANEL CONSTRUCTION

LaRue S. Newman, 2033 S. Eureka Ave., Springfield, Mo. 65804

Filed Mar. 16, 1984, Ser. No. 590,160

Int. Cl.⁴ E04C *1/00, 2/34;* **B28B** *1/16*

U.S. Cl. 52—309.11 **11 Claims**



1. A prefabricated building panel comprising:

a pair of generally parallel, spaced apart sheet members comprising the major surfaces of said panel;

a segmented strip interposed between said members and extending around the periphery of the panel;

releasable means securing said panels to the strip segments;

a plurality of slab shaped spacers interposed in mutually spaced apart disposition between the members and arranged in a plurality of transversely and longitudinally extending rows to define between said rows of spacers a grid of longitudinally and transversely extending voids across the panel, the spacers being spaced inwardly from the inner surfaces of said members and the strip segments respectfully; and

an initially flowable, hardened, rigid material surrounding each spacer and completely filling the void between said members and between the respective adjacent spacers, said material being bonded to the inner surfaces of the members and defining a continuous grid of said rigid

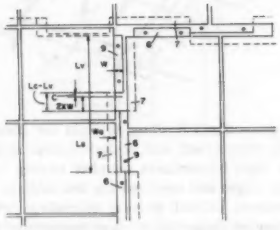
material throughout the panel binding the panel together and preserving the positional integrity of the spacers.

4,548,008

TILE PANEL HAVING CONVEX AND CONCAVE PORTIONS AROUND SUBSTRATE BOARD, AND METHOD FOR PRODUCTION THEREOF

Hisashi Maeda, Tokoname, Japan, assignor to Inax Corporation, Tokoname, Japan

Filed Mar. 25, 1983, Ser. No. 479,103
Int. Cl.⁴ E04F *13/08*
U.S. Cl. 52—392 **8 Claims**



1. A prefabricated tile panel consisting essentially of a flat substrate board having substantially rectangular convex portions and substantially rectangular concave portions by turns around the sides of the substrate board, and a multiplicity of tiles arranged in a right-angled tetragon fashion and bonded onto the substrate board; said bonded tiles constituting a fundamental right-angled tetragon form, said rectangular convex portion being protruded by a given width of W from the fundamental tetragon form and having a side length of Lv; Lv being larger than W; said rectangular concave portion being set back by a width of at least W from the fundamental tetragon form and having a side length of Lc; the relationship between the W, Lv and Lc being defined by the following expression,

$$Lc = Lv + 2 \times W;$$

said rectangular concave and convex portions being arranged regularly by turns on a basis of the shape of the fundamental tetragon form around the side of the substrate board in such a fashion that each side of the substrate board starts with one of the concave and convex portions followed by other portions by turns and ends with the other portion; the shape of a corner of the tile panel being substantially point-symmetrical with that of a diagonally opposite corner about the center of the diagonal; and the positions of the convex and concave portions present at one side of the tile panel substantially falling line-symmetrically under those of the other portions present at the opposite side thereof whereby said panel may be substantially symmetrically rotated within the plane of said flat substrate board 180° about the center of said panel.

4,548,009

CONCRETE EXPANSION JOINT

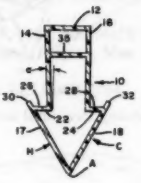
Donald E. Dahowski, York, Pa., assignor to Quaker Plastic Corporation, Mountville, Pa.

Continuation-in-part of Ser. No. 294,107, Aug. 19, 1981, abandoned. This application Mar. 14, 1984, Ser. No. 589,366
Int. Cl.⁴ E04B *1/68;* E01C *11/02*
U.S. Cl. 52—396 **5 Claims**

1. A structural joint element adapted to be embedded in concrete to accommodate expansion and contraction of concrete sections that are immediately contiguous to said joint element consisting essentially of longitudinal integrally formed hollow one-piece extruded member which in cross section is generally in the form of an arrow head, said one-piece member being formed of:

(a) a substantially rectangular shaped relatively narrow hollow upper stem portion having a pair of spaced substantially vertical side walls and a horizontal wall closing the top of said side walls;

(b) a V-shaped lower portion, the sides of said V-shaped lower portion forming an apex at the bottom and the top of said sides of said V-shaped portion being spaced from and being connected to said upper stem portion by



(c) substantially horizontal segments extending outwardly from the bottom of each of said side walls of the upper stem portion and connected contiguous to the top, and at the inner face, of the sides of said V-shaped lower portion, and

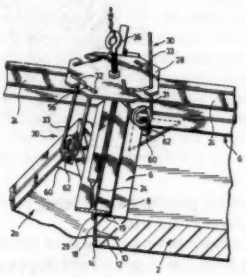
(d) a transverse web spanning the interior of the upper stem portion and joining said spaced substantially vertical side walls at a point intermediate the top and bottom of said vertical side walls of the upper stem portion.

4,548,010

CONCEALED SUSPENDED CEILING SYSTEM

Roy A. Hintsa, Etobicoke, Canada, assignor to Decoustics Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 277,166, Jun. 25, 1981, Pat. No. 4,438,613. This application Aug. 17, 1983, Ser. No. 523,784
Int. Cl.⁴ E04B *5/52*
U.S. Cl. 52—484 **47 Claims**



1. A ceiling panel for use in a suspended ceiling system to define an essentially horizontal ceiling surface, said ceiling panel comprising a body member of acoustical dampening material have at least one essentially planar surface, said body member having straight side edges generally perpendicular to said planar surface which define the ceiling panel periphery, generally "L" frame members secured to the side edges of said body member to overlie a portion of a top surface of said panel and abutting the side edges thereof, each of said frame members including an inwardly directed planar projection snuggly received within a kerf provided in the side edge of said body member, said frame member being bonded to said body member by an adhesive whereby said frame member when secured

to a body member cooperates with said body member to stiffen said panel.

4,548,011

PREFABRICATED SHINGLE PANEL

Otis S. Martin, 4291 Stevenson #30, Fremont, Calif. 945.\8

Continuation of Ser. No. 294,832, Aug. 21, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,440

Int. Cl.[4] E04D *1/20*

U.S. Cl. 52—551 **8 Claims**

1. A panel construction comprising a plurality of shingles positioned in alignment with one marginal edge of one shingle overlapping a portion of the other shingle, a first transverse mounting strip of a bar construction disposed between the marginal edge of said one shingle and the underlying shingle, means attaching opposite sides of said first mounting strip to confronting surfaces of said one shingle and said underlying shingle respectively, and a second mounting strip of a bar construction secured to the underlying shingle on the side of the shingle opposite to the side where said first mounting strip is attached and in substantially underlying alignment with said first mounting strip, each of said strips having a sufficient thickness to maintain structural integrity for the panel construction and to provide a rigid load support for the panel construction.

4,548,012

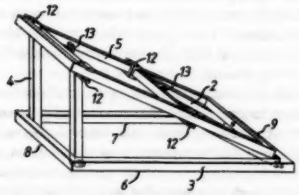
COLLAPSIBLE FRAMEWORK

David C. Dyer, Enfield, United Kingdom, assignor to Paul Weston, London, England

Continuation of Ser. No. 302,543, Sep. 16, 1981,. This application Jan. 13, 1984, Ser. No. 570,422

Int. Cl.[4] A47B *43/00;* **A47F** *5/00;* **E04H** *12/18;* **E04B** *1/346*

U.S. Cl. 52—646 **1 Claim**



1. A collapsible structure comprising at least four rectangularly shaped frame members connected to define an enclosure, one of said rectangularly shaped members constituting a bottom frame member and another rectangularly shaped member constituting an upper frame member with the remaining rectangularly shaped members constituting end frame members, said bottom and upper frame members each consisting of a pair of spaced parallel side elements joined together at their respective ends by end elements, said end frame members each consisting of a pair of spaced parallel side elements joined at one end by an end element disposed in a plane normal to the plane of the spaced parallel side elements, pin means mounted in and projecting outwardly from the side elements of said end frame members remote from said end element, said outwardly projecting portion of said pin means pivotally mounted in an end portion of the spaced parallel side elements of said bottom frame member, said end element of each of said end frame members having a U-shaped bracket pivotally mounted on the respective ends thereof by pins extending through the base of each bracket and projecting into the respective ends of said end element, said open end of said brackets projecting over the side elements of said upper frame member whereby said brackets are capable of sliding movement along the side elements of said upper frame member towards the center of said upper frame member contemporaneous with the pivoting of the end frame members about the pins in the side elements of said bottom frame member and fastening means carried by the end element of said end frame members and engagable with the end elements of said upper frame member for maintaining said bottom and upper frame members in locking engagement with said end frame members.

4,548,013

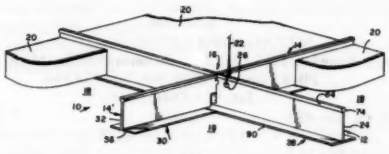
CEILING SUSPENSION SYSTEM

Enrique Reina Briceno, c/o Arte Ilumi, S.A., Avda. Parima - Qta. Canaveral, Colinas de Bello Monte, Caracas, Venezuela

Filed May 9, 1984, Ser. No. 608,561

Int. Cl.[4] E04C *2/42*

U.S. Cl. 52—667 **14 Claims**



1. A ceiling suspension system, comprising:

at least one main beam constructed and arranged to be suspended in an at least generally horizontal disposition from an overlying building structure such as a floor slab;

said main beam including a generally horizontal bottom flange, a web based on said bottom flange and extending upwardly therefrom, and a top bead provided as a thickening extending longitudinally along said web distally of said bottom flange;

means defining a generally narrow, vertically oriented slot through said web between said top bead and said bottom flange, said slot including at least one localized spot of substantially wider width disposed intermediate the vertical extent of the slot; and

at least one cross tee constructed and arranged to disconnectably connect at an end thereof with said main beam proximally of said slot;

said cross tee including a generally horizontal bottom flange, a web based on said bottom flange and extending upwardly therefrom, and a top bead provided as a thickening extending longitudinally along said web of said cross tee distally of said bottom flange of said cross tee;

said cross tee at said end including a portion of said web projecting longitudinally of said cross tee to provide a tab having less vertical extent than said web of said cross tee, so that said cross tee end is, in effect, provided with an upper notch over said tab and a lower notch under said tab;

means providing an end surface on said top bead of said cross tee at said end of said cross tee, and means providing an end surface on said bottom flange of said cross tee at

said end, said tab projecting longitudinally of said cross tee at said end beyond both said top bead end surface and said bottom flange end surface; and

means defining a laterally projecting localized boss on said tab disposed longitudinally beyond both said top bead end surface and said bottom flange end surface and including a stop surface facing longitudinally oppositely to said end of said cross tee;

said boss being disposed relatively lower on said cross tee than a respective said wider spot of said slot of said main beam, and said top bead end surface, bottom flange end surface and boss stop surface being so constructed and arranged that as said tab is aligned with said slot, elevated to place the boss and said respective wider spot at a same level, projected through the slot until said boss stop surface has emerged through the web of the main beam, then lowered until the bottom flange of the main beam and the bottom flange of the cross tee are at a same level, said end surface of said bottom flange of said cross tee abuttingly engages the bottom flange of said main beam along a side edge of said bottom flange of said main beam, said end surface of said top bead of said cross tee abuttingly engages the top bead of said main beam along a side edge of said top bead of said main beam, and said stop surface of said boss abuttingly engages an opposite side surface of said web of said main beam beside said slot and below said respective wider spot, thereby securely bracing said cross tee against said main beam to provide a relatively rigid joint therebetween;

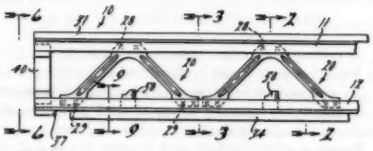
said bottom flange of said main beam and said bottom flange of said cross tee being constructed and arranged to cooperatively support a ceiling panel.

4,548,014

METAL JOIST CONSTRUCTION

James Knowles, 1275 Club Dr., Bloomfield Hills, Mich. 48013

Filed Mar. 28, 1980, Ser. No. 134,984
Int. Cl.[4] E04C *3/18*
U.S. Cl. 52—693 **9 Claims**



1. A truss formed of a pair of aligned, spaced apart chords interconnected by sheet metal webs, the improvement comprising,

said chords each being formed of a pair of elongated right angled-shaped in cross-section metal strips, said strips having parallel, slightly spaced apart vertical legs which form a narrow gap between the strips, and horizontally aligned, oppositely extending horizontal legs,

said webs each being provided with flattened, opposite end portions snugly arranged within their adjacent gaps and in face-to-face contact with the aligned vertical legs of their respective chords and being fastened to such vertical legs,

a first wood member positioned upon the horizontally aligned legs of at least one of the chords and being elongated and being fastened to said chord by nails extending through the wood member and into the gap between the adjacent strip vertical legs of that chord, with the nails being of a diameter for frictionally locking within the gap against their adjacent vertical leg portions,

at least one second wood member, said second wood member positioned at an end of the truss and extending substantially perpendicular between the adjacent chords, and

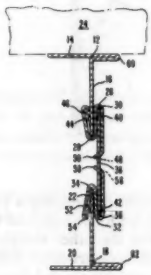
securing means securing the opposite ends of said second wood member to its adjacent chord end, said means comprising U-shaped holders having flanges thereon, said holder holding the opposite ends of said second wood members, and said flange being fitted within the gap between the vertical legs of the chords.

4,548,015

THERMALLY BROKEN INSULATION SUPPORT STRUCTURE

Harold Switzgable, 5 Lyndon La. South, Box 171, Monmouth Junction, N.J. 08852

Filed Jul. 25, 1983, Ser. No. 516,617
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—729 **14 Claims**



1. A thermally broken insulation support structure, usable with any type of insulation and specifically usable with blocks of polystyrene or other block insulation material, which comprises:

(a) a first support member including a first facing member and a first mounting arm extending outwardly therefrom, said first mounting arm including a first shoulder means;

(b) a second support member including a second facing member and a second mounting arm extending outwardly therefrom toward said first mounting arm and being spatially disposed with respect thereto, said first facing member and said second facing member being spatially separated and approximately parallel with respect to one another, said second mounting arm including a second shoulder means;

(c) a first clip means defining a first outward gripping slot therein to grip and hold the outwardly extending end of said first mounting arm, said first clip means further defining a first inward gripping slot therein, said first clip means including a first tab means adjacent to said first outward gripping slot and adapted to engage said first shoulder means to detachably secure said first mounting arm with respect to said first clip means;

(d) a second clip means defining a second outward gripping slot therein to grip and hold the outwardly extending end of said second mounting arm, said second clip means further defining a second inward gripping slot therein, said second clip means including a second tab means adjacent to said second outward gripping slot and adapted to engage said second shoulder means to detachably secure said second mounting arm with respect to said second clip means; and

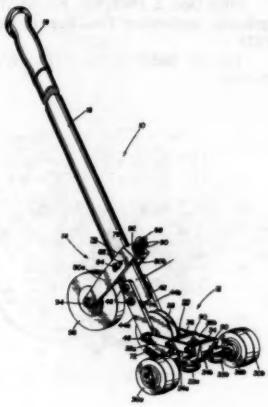
(e) a thermal isolation member of thermally insulated material including a first end means and a second end means, said first end means being detachably securable within said first inward gripping slot of said first clip means and said second end means being detachably securable within said second inward gripping slot of said second clip means.

4,548,016

MEMBRANE FASTENER APPARATUS

Charles S. Dubich, Akron, and James H. C. Yang, Cleveland, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 18, 1983, Ser. No. 524,511
Int. Cl.[4] E04D *15/00*
U.S. Cl. 52—749 **6 Claims**



1. An apparatus for mechanically securing a flexible sheet, extending over a channel member, having a central longitudinal slot in its top surface, to said channel member via a flexible resilient strip adapted for retaining adjacent portions of the flexible sheet within said channel member, said apparatus comprising:

a. a frame assembly;

b. means for supporting said frame assembly a predetermined distance above said channel member and said flexible membrane overlaying said channel member and for moving said frame assembly along said channel member;

c. tandem pairs of opposed rearwardly converging tandem roller assemblies rotatably mounted on said frame assembly for receiving and temporarily elastically deforming said strip of resilient material into an inverted V-shape having a width less than that of said channel member slot;

d. a grip and insert wheel rotatably vertically journaled in said frame assembly in tandem with said roller assemblies so that its center plane is coincident with a vertical plane passing through the longitudinal axis of said channel member, said wheel including a peripheral channel for gripping the apex portion of said inverted V-shaped strip and pushing at least a portion of said strip together with abutting portions of said flexible membrane into said channel member; and

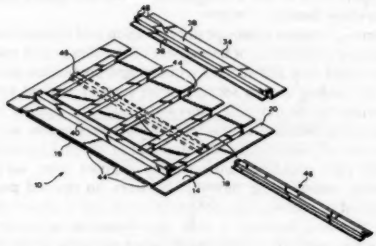
e. a pressing tool assembly attached to said support means in alignment with said grip and insert wheel, said pressing tool assembly including a rotatably vertically journaled wheel member extending into said channel member slot and having its center plane coincident with a vertical plane passing through the longitudinal axis of said channel member, said wheel member being adapted to come into gradual contact with the apex portion of said inverted V-shaped resilient strip to both fully insert said strip into said channel member and thereafter return said strip to approximately its natural shape to thereby retain adjacent portions of said membrane within said channel member.

4,548,017

BUILDING PANEL

Jack Blando, Brooklyn, N.Y., assignor to Liverpool Industries, Inc., Brooklyn, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,148
Int. Cl.[4] E04C *2/32*
U.S. Cl. 52—814 **8 Claims**



1. A building panel comprising:

flat sheet member of generally rectangular configuration having a plurality of parallel and integrally formed raised ribs positioned across a portion of said sheet and terminating in ends;

at least two side beam members located at approximately a right angle to said ribs having a first flange positioned over a portion of the respective ribs and affixed thereto and a second elongated flange affixed to the sheet beyond the ribs, interposed between said first and second flange a connecting member integral therewith having an arm thereof abutting a plurality of rib ends; and

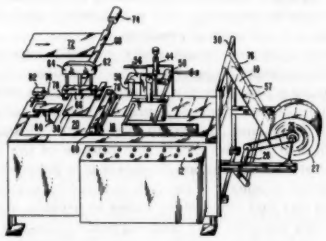
center beams positioned between said side beams and affixed to said respective ribs.

4,548,018

APPARATUS FOR HORIZONTALLY FORMING, FILLING AND SEALING FILM POUCH MATERIAL

John Wojnicki, 10 Millstone Dr., Cranbury, N.J. 08512

Filed Jun. 29, 1984, Ser. No. 625,936
Int. Cl.[4] B65B *9/08, 5/02*
U.S. Cl. 53—51 **24 Claims**



1. An apparatus for horizontally forming, filling and sealing film pouch material comprising:

(a) a frame means for supporting a plurality of processing stations thereon and including a first section and a second section thereof, said frame means defining a horizontally extending support table in said first section and a support carriage in said second section, said support carriage being longitudinally movable along said frame means between a first position adjacent said first section and a second position further spatially displaced therefrom;

(b) a film unwinding device for continuously supplying of film pouch material;

(c) roller means for guiding of film pouch material from said

film unwinding device onto said support table into a horizontally extending orientation onto said support table of said first section of said frame means;

(d) header sealing means positioned on said support table being selectively engageable with respect to the horizontally extending film pouch material to form a header seal adjacent to the top area thereof;

(e) labeling means located upon said horizontally extending support table to add a designation to the film pouch material traveling thereon;

(f) film registration means positioned upon said support table to indicate positioning of movement of the film pouch material upon said first and second sections and correction thereof;

(g) side sealing means secured with respect to said support carriage to be movable therewith, said side sealing means extending laterally across said support carriage to side seal horizontally extending film material at desired locations to form film pouches connected by support trim, said side sealing means being movable between an opened position adapted to receive film material therein and a closed clamping position forming a side seal between adjacent film pouches, said side sealing means being movable to the closed clamped position while said support carriage is in the first position and prior to movement thereof toward said second position to urge the film pouch material to move therewith as said support carriage moves from said first position to said second position, said side sealing means being movable to the opened position only after said support carriage completes movement to said second position and prior to initiating movement toward said first position;

(h) end sealing means secured to said support carriage to be movable therewith, said end sealing means being movable between an opened position adapted to receive horizontally extending film material therein and a closed clamping position forming an end seal in the film pouch, said end sealing means being movable to the closed clamping position while said support carriage is in the first position and prior to movement toward said second position to urge the film pouch material to move therewith as said support carriage moves from said first position to said second position, said end sealing means being movable to the opened position only after said support carriage completes movement to said second position and prior to initiating movement toward said first position;

(i) infeed chute means positioned at the same location as said end sealing means and adapted to fill product into each horizontally extending film pouch when said end sealing means is in the opened position;

(j) a trim clamping means being movable from an opened position adapted to receive excess trim material to a closed clamping position fixedly gripping the excess trim material, said trim clamping means being secured with respect to said frame means and adapted to move to the closed clamping position to grip the excess trim portion of the film pouch material while said support carriage is in the second position and prior to release of the film material by said side sealing means and said end sealing means to prevent movement of said film material with said support carriage as it travels from said second position to said first position, said trim clamping means being movable to the opened position releasing said trim portion of said film material while said support carriage is in the first position and after said side sealing means and said end sealing means have moved to the closed clamping position to allow movement of the film material with said support carriage as it moves from said first position to said second position; and

(k) a product clamping means secured to said frame means and movable between an opened position adapted to receive a fully formed, filled and sealed horizontally extending film pouch therein and a closed clamping position firmly gripping the film pouch therein, said product clamping means adapted to move to the closed clamping position when said trim clamping means is also in the closed clamping position to remove the completed pouch from the excess trim material.

4,548,019

PACKING MACHINE FOR CIGARETTES OR THE LIKE

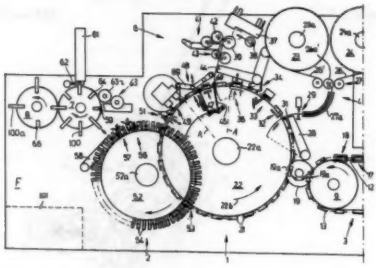
Friedel Kruse, Oststeinbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,731

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245424

Int. Cl.⁴ B65B *11/32, 19/24, 49/12*

U.S. Cl. 53—170 **16 Claims**



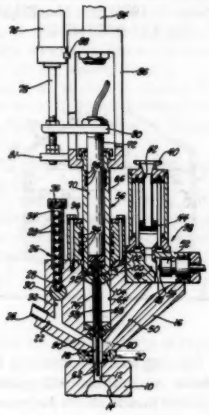
1. In a packing machine for arrays of cigarettes or other articles of the tobacco processing industry, the combination of a conveyor having a series of spaced-apart hollow mandrels arranged to advance in a predetermined direction along a predetermined path, each of said mandrels having a front side and a rear side, as considered in said direction; means for introducing arrays of articles into successive mandrels in a first portion of said path; a source of foldable blanks; means for supplying blanks from said source into spaces between successive mandrels in a second portion of said path downstream of said first portion; means for draping the thus supplied blanks about the mandrels which follow the supplied blanks so that each draped blank includes a pair of overlapping marginal portions at the rear side of the respective mandrel; and means for holding the blanks against the mandrels, including biasing members disposed between successive mandrels of said series and arranged to share the movement of said conveyor, means for moving successive biasing members against the freshly supplied blanks at the front sides of the mandrels following the respective biasing members in a third portion of said path downstream of said second portion, and means for shifting successive biasing members against the overlapping marginal portions of draped blanks at the rear sides of the preceding mandrels in a fourth portion of said path downstream of said third portion, one of said moving and shifting means comprising a stationary cam and said holding means further comprising a lever for each of said biasing means, said levers being pivotally mounted on said conveyor and having follower means arranged to track said cam, said cam including a first section arranged to maintain said biasing members in engagement with the folded marginal portions of blanks at the rear sides of the respective mandrels in said fourth portion of said path, and a second section movable between first and second positions in the region between the third and fourth portions of said path to thereby shift successive biasing members from engagement with the blanks at the front sides of the adjacent upstream mandrels into engagements with the folded marginal portions of blanks at the rear sides of the adjacent downstream mandrels.

4,548,020

ASSEMBLY FOR FILLING A CONTAINER

Walter J. Rozmus, Traverse City, and Peter A. Hochstein, Sterling Heights, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Sep. 20, 1982, Ser. No. 419,731
Int. Cl.[4] B65B *1/00*
U.S. Cl. 53—268 13 Claims



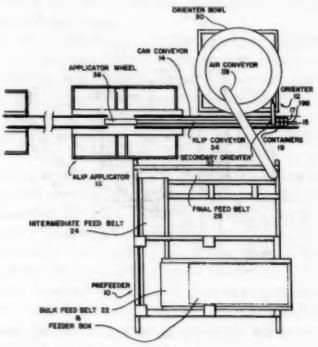
1. A filling assembly for filling a container (10) through a receiving passage (12) of a predetermined length therein with material, said assembly including a housing (16) having a fill passage (18) for communicating with the receiving passage (12) of a container (10), a vacuum source (24) for withdrawing gas from the container (10) and the fill passage (12), material supply means (40) for supplying material to said fill passage (18) for filling the container (10) through the receiving passage (12), delivery control means (38) having an "on" condition for allowing material to flow from said material supply means (40) to said fill passage (18) and an "off" condition for terminating such flow and sealing said material supply means (40) from said fill passage (18), plug magazine means (26, 125) storing a plurality of plugs (28) for delivering one plug at a time to said fill passage (18) so that the plug (28) engages the receiving passage (12) of the container (10) and for maintaining a vacuum seal between said plug magazine means (26, 125) and said fill passage (18) to maintain a vacuum therein, a snout means (56) having a bore (58) extending thereinto from a distal end (60) thereof and movable from an initial position through said fill passage (18) to a ram position to engage a plug (28) and force the plug (28) into the receiving passage (12) of the container (10) to seal the container (10), and probe means (62) disposed in said bore (58) of said snout means (56) and movable between a retracted position and a sensing position extending through said fill passage (18) and into the receiving passage (12) of the container (10) for providing a full signal when the level of material in the container (10) reaches said probe means (62) for controlling said delivery control means (38), probe actuation means (76, 78, 80) for moving said probe means (62) between said retracted position and said sensing position, snout actuation means (84, 86) for moving said snout means (56) between said initial position and said ram position, said probe actuation means (76) being supported (88) by said snout actuation means (86) for movement therewith upon actuation of said snout actuation means and for movement relative to said snout means in moving said probe means between said retracted and sensing positions.

4,548,021

MULTIPLE CONTAINER PACKAGING SYSTEM

James S. Bader, Lakewood, and Larry M. Dugan, Boulder, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Jun. 3, 1983, Ser. No. 501,008
Int. Cl.[4] B65B *21/24, 61/14*
U.S. Cl. 53—398 18 Claims



1. The method of applying connecting clips, each of the clips comprising a central portion having an opening formed therein and a plurality of ear portions extending outwardly in a radial direction from the central portion with the ear portion being spaced ninety degrees apart so as to have a longitudinal center line between pairs of ear portions spaced one hundred and eighty degrees apart, to groups of unattached containers to form multiple container packages of at least four containers, comprising the steps of:

continuously forming a plurality of parallel rows of said containers;

conveying said plurality of parallel rows of said unattached containers to a clip applicator;

separating said unattached containers by a predetermined distance to define central gaps between adjacent unattached containers suitable for applying said connecting clips by transversely separating said unattached containers by a predetermined distance using a plate divider; and longitudinally separating said unattached containers by a predetermined distance using side lugs which couple directly to sidewalls of said containers;

feeding a plurality of clips to a first separating and orienting means;

separating said clips one from another;

feeding said separated clips to a first track for movement over said track and orienting said clips so that the longitudinal center lines of each clip form an x in relation to the direction of movement of said clips over said first track;

moving said clips to a second orienting means;

rotating said clips through forty-five degrees in said second orienting means;

feeding said rotated clips to a second track and moving said clips over said second track so that the longitudinal center lines of each clip form a + in relation to the direction of movement of said clips over said second track;

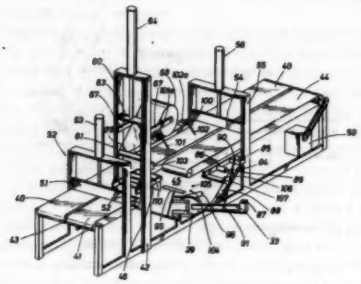
positioning said connecting clips for application to said central gaps between said unattached containers using a clip applicator wheel;

applying said connecting clips to said groups of unattached containers by forcing said connecting clips into said central gaps using a cam actuated clip applicator.

4,548,022
TAPING MACHINES

Leonard L. Yaklin, Houston, Tex., assignor to American Specialty & Supply, Inc., Houston, Tex.

Filed Oct. 3, 1983, Ser. No. 538,146
Int. Cl.[4] B65B *61/00*
U.S. Cl. 53—415 14 Claims



1. A method for applying an adhesive sealing tape to the corner of a package member from a roll of adhesive sealing tape including the steps of:

overlaying the end of an adhesive sealing tape from a roll of adhesive tape so that a lengthwise part of the sealing tape lies on the upper horizontal surface of a package member and the other lengthwise part extends outwardly away from the vertical side surface of the package member;

applying sealing pressure to the lengthwise part of the sealing tape on the upper surface of the package member for affixing that lengthwise portion of sealing tape to the upper surface and continuously applying a lengthwise part of the sealing tape to the vertical end surface and to the horizontal bottom surface of the package member while applying sealing pressure to affix that portion of the sealing tape to the package member until the sealing tape is extended to a location below the horizontal bottom surface package member while the other lengthwise part extends outwardly away from the vertical end surface and the bottom surface;

severing the sealing tape from the roll of adhesive sealing tape at a location below the horizontal bottom surface of the package member; and

simultaneously applying a wiping pressure to the other lengthwise part of the sealing tape with respect to the upper, bottom and side surfaces of the package member to sealingly apply pressure to the sealing tape with respect to the upper, bottom and side surfaces of the package member.

5. Apparatus for applying tape to the corner of an elongated container comprising:

conveyer belt means for conveying containers through said apparatus;

taping means for selectively applying from a roll of adhesive sealing tape a continuous lengthwise portion of adhesive sealing tape to the upper surface, end surface and bottom surface of a corner of a container on the conveyer belt means, means on said taping means for supporting a supply roll of adhesive sealing tape, said taping means being located relative to the conveyer belt means to leave a portion of the adhesive tape extending over one side of a container;

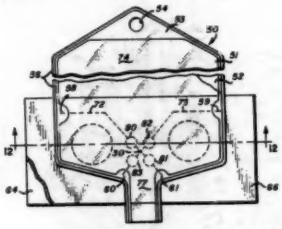
cutter means for selectively severing an applied strip of adhesive sealing tape from a roll of adhesive sealing tape at a location below a container on a container belt; and

wiper means for simultaneously applying pressure to an applied strip of adhesive sealing tape along the upper surface, lower surface and side surface of a container for bringing the portion of the adhesive tape extending over the one side of the container into sealing contact with respect to the container.

4,548,023
METHOD AND APPARATUS FOR FORMING A PLASTIC ENCLOSURE FOR FLUIDS WITH SELECTIVELY INTERCONNECTABLE INTERNAL COMPARTMENTS

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed Jan. 9, 1981, Ser. No. 223,931
Int. Cl.[4] B65B *47/04*
U.S. Cl. 53—452 4 Claims

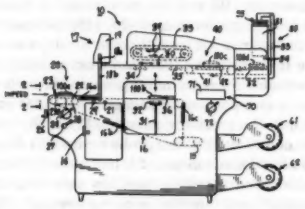


1. A method for forming a fluid containing bag with selectively interconnectable compartments comprising pressing a plurality of thin, flexible plastic sheets between a planar surfaced plate and a ridged plate having outwardly extending projections terminating in flat, substantially co-planar pinching surfaces, to form a plurality of compartments between the plastic sheets with fluid flow passageways therebetween, by effecting sealing engagement of the plastic sheet against a second surface in compartment defining fillet zones, and introducing fluid into at least one of the compartments.

4,548,024
INTEGRATED STRETCH-WRAP PACKAGING SYSTEM

Harvey A. Fine, Sayreville, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Division of Ser. No. 245,283, Mar. 19, 1981, Pat. No. 4,458,470.
This application Apr. 16, 1984, Ser. No. 580,129
Int. Cl.[4] B65B *11/16*
U.S. Cl. 53—502 22 Claims



1. A method for weighing, stretch wrapping and labelling a trayed product in a unitary weighing and wrapping machine for use in supermarkets, retail stores, and the like, comprising:

manually placing an unwrapped trayed product to be weighed and wrapped on a scale in a weighing station that is an integral part of said machine;

weighing the trayed product while it is on said scale before it is wrapped, including generating an electrical signal corresponding to the weight of the unwrapped trayed product;

withdrawing a length of stretch wrapping film from a film supply, to have the length of film extend through a region

that lies, in the path of product flow through said machine, between the weighing station and a sealing station that is an integral part of said machine, the sealing station being disposed downstream of the weighing station in the direction of said product flow;

enveloping the top portion of the product in the length of stretch wrapping film after the product has been weighed;

tucking at least one edge of the film under the tray bearing the product;

advancing said trayed product and the length of enveloping stretch wrapping film along the path of product flow to said sealing station, to thereby further envelop the trayed product in the stretch wrapping film while the trayed product is being advanced to the sealing station;

severing the length of stretch wrapping film, the severing occurring at a point disposed between said scale and said sealing station, before said product is completely wrapped in said stretch film;

sealing at least certain of the tucked edges under the tray in the sealing station; and

applying a label to said stretch wrapping film, after it has been stretched, to specify the weight of the unwrapped trayed product in accordance with said electrical signal, after the film has been tucked under at least certain of the edges of the tray.

4,548,025

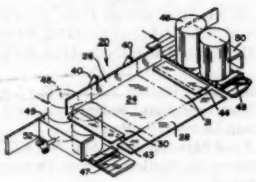
TRAY ERECTING APPARATUS WITH ADJUSTING CAPABILITY

Raymond A. Heisler, 224 Passaic Ave., Fairfield, N.J. 07007

Continuation-in-part of Ser. No. 310,604, Oct. 9, 1981, abandoned. This application Oct. 30, 1984, Ser. No. 666,479

Int. Cl.[4] B65B *11/08*

U.S. Cl. 53—580 **19 Claims**



1. Apparatus for receiving and transporting tray blanks having a midportion for receiving articles and surrounded by front and rear flap edge portions, front and rear side flap portions and outermost side flaps from an arrayed stack and with an adjustable tray erecting and filling apparatus disposed to advance the filled trays to packaging operations, said adjustable tray erecting and filling apparatus including:

(a) a frame including a center plate and two outer plates, each outer plate movable toward and away from the center plate by adjusting means;

(b) a loading chute carried by said frame, said chute adapted to carry tray blanks as flat, sheet-like members in a side-by-side manner and in a forward sloped manner to a delivery hopper;

(c) means for delivering and supporting the tray blanks in said delivery hopper while providing support means for the lower edge of each tray blank and outer stop means for retaining the opposite or outer edge of said tray blank, these tray blanks disposed in said hopper at a slope of about thirty degrees to the horizontal;

(d) means for adjusting the width and length of the chute, hopper and stop means for the sloped stack of tray blanks so as to accommodate a determined width and length of a tray blank;

(e) means for engaging and removing the lowermost tray blank in said hopper with and by a plurality of vacuum cups and selectively applying vacuum to move and remove said lowermost tray blank to an erecting apparatus whereat and whereby said tray blank is brought to a forwardly advancing reciprocable table, with a rear flap edge portion brought against stops on said table that fold said rear portion to a position normal to the midportion of the tray blank;

(f) a pair of infeeding conveyors positioned adjacent to the tray blank and adapted to receive contained products to be placed in an erected tray, said contained products received in random order and subsequently arranged in a determined grouping;

(g) a pair of adjustably controlled pushers disposed to receive and position the products on the conveyors and to substantially and simultaneously advance the pushers sufficiently to urge and move the products to said midportion of the tray, the stroke of each of the pushers sufficient to urge and move the contained products sufficiently so that the flaps of the tray may be brought to a position substantially normal to the midportion of the tray;

(h) a support member carried on the center plate, this support member having a rotatable shaft movable in response to signal means to a cylinder and the like;

(i) a selectively positioned plurality of fingers carried and secured to said rotatable fingers in the support member, the shaft disposed and pivoted so as to engage the forward or front edge flap portion of the tray blank and move said forward flap portion to an erected position normal to the midportion of the tray, means for moving the fingers in response to a signal indicating determined placement of the product on the midportion of the tray blank, and for moving the fingers below the tray when the tray has been moved forwardly a determined distance;

(j) a reciprocable table apparatus carried on at least one of the outer support plates, this table apparatus including and carrying said stop disposed so as to engage and cause the tray blank to be brought to the condition with the back edge of the tray brought to a position normal to the center of the tray blank;

(k) a pair of toggle actuated pivot finger mechanism carried by and pivotable relative the reciprocable table apparatus, each finger mechanism including a first member whose distal ends are pivotally connected to a like member of said mechansim, and after the contained products and to the reciprocable table, means for moving said like member forwardly ater folding the front edge flap by said pivoting fingers at a speed in excess of the speed of the table to pivot said first member about its connection to the table to engage a rear side flap portion and move said portion to a position substantially at right angles to the erected rear side edge portion, each of the pivoted finger members disposed adjacent a side of said reciprocated table on which the midportion of the tray blank is carried and with each pivoted finger movable in a plane substantially parallel to the plane of travel of the reciprocated table, and after the toggle actuation has caused the rear flap to be moved to the desired position the finger mechanism is moved forwardly at the speed of the table;

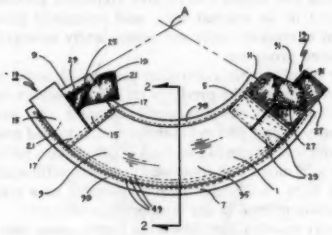
(l) means for advancing the reciprocable table to move the partially erected tray while the first member engages the rear side flap of a tray to retain said erected flap in position during forward advancement of the tray to a selected limit, after which the pivoted finger mechanism is again rotated to a non-engaging flap erecting position during rearward movement of the table;

(m) plow means disposed to engage each forward side flap portion, and as the tray is advanced forwardly and to a selected position the pivoted actuated apparatus is retracted and said plow means causes the outer forward flaps to be folded inwardly and to a position substantially at right angles to the now-erected forward edge of the tray, and p1 (n) means for bringing the outermost side flaps against the front and rear side flaps and securing the outermost side flaps and the front and rear side flaps into retaining end members of an erected tray.

4,548,026
EQUIDAE CORONET BOOT

Morris I. Shidner, 1046 Elm St., Ramona, Calif. 92065

Filed Apr. 23, 1984, Ser. No. 602,679
Int. Cl.[4] A01L 5/00
U.S. Cl. 54—82 7 Claims



1. A protective coronet boot for members of the Equus Caballus family comprising a layer of flexible elastomeric foam sandwiched between opposed layers of strong, flexible, low-friction material in the flattened shape of a circular trapezoid defined by opposed upper and lower curved edges and opposed first and second ends wherein:

(a) said upper curved edge is of a length at least the circumference of the animal's pastern; and,

(b) said lower curved edge is of a length at least the circumference of the bottom of the animal's hoof;

and further including means adjacent said opposed ends to join them in mutual abutment said means comprising at least one double-sided Velcro ® strip extending from one side of said first end for receipt between opposed Velcro ® surfaces formed on the same side of said boot at said second end.

4,548,027
COMBINE HARVESTER

Kazuyuki Maeoka, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 7, 1984, Ser. No. 586,915
Claims priority, application Japan, Nov. 11, 1983, 58-212889; Nov. 11, 1983, 58-212890; Nov. 14, 1983, 58-213744; Nov. 14, 1983, 58-213745; Nov. 17, 1983, 58-216833
Int. Cl.[4] A01D 41/00; A01F 12/00
U.S. Cl. 56—10.2 6 Claims

1. A combine harvester driven by an engine through speed-changing means comprising:

sensor means for generating load pulses indicative of load on said engine;

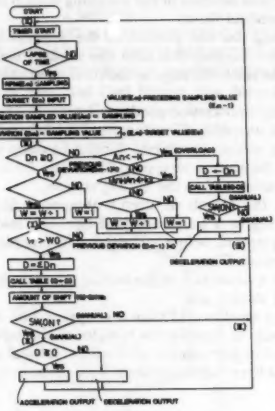
processing means for periodically determining a load value (En) from said load pulses and for determining and storing a deviation value (Dn) which is a function of a difference between said load value (En) and a preset load value (Eo) and a load variation (An) which is a function of a difference between two successive load values (En−1), (En);

counter means which advances when deviation values of the same sign are successively stored and which resets when a deviation value of an opposite sign is stored and which generates a signal after a count reaches a predetermined number (Wo);

averaging means responsive to said signal for providing an average deviation value (D) of said predetermined number (Wo) of deviation values and for generating a first control command;

OR means in response to a negative deviation value for generating a second control command and resetting said counter means when said negative deviation value is less than a lower threshold value (−K) or when the difference in magnitude between two successively stored load variations (An−1), (An) is greater than a predetermined value (Kx);

control means for operating said speed-changing means on the basis of said average deviation value (D) when a first control command is received from said averaging means,

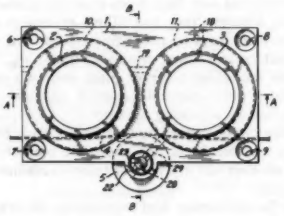


and on a basis of said negative deviation value when a second control command is received from said OR means.

4,548,028
BEARING HOUSINGS FOR DRIVEN AND AIR-SUSPENDED SPINNING RINGS ON RING-SPINNING MACHINES AND RING-TWISTING MACHINES

Gunter Rebske, and Manfred Voigt, both of Karl-Marx-Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, German Democratic Rep.

Filed Mar. 22, 1983, Ser. No. 477,797
Claims priority, application German Democratic Rep., May 14, 1982, 2398510
Int. Cl.[4] D01H 7/58
U.S. Cl. 57—124 6 Claims



1. In a bearing housing for driven and air-suspended spinning rings on the ring rails of ring-spinning and ring-twisting machines in which a tape drive with tensioning pulleys is provided for driving the spinning rings, the improvement comprising at least two spinning rings and one tensioning pulley arranged on said bearing housing, air means for air suspending said spinning rings in said housing, means mounting said tensioning pulley in said housing for tensioning said tape against the peripheries of said rings and means for mounting said housing on the ring rails of the ring-spinning and ring twisting machines.

4,548,029

METHOD OF AND APPARATUS FOR EXCHANGING BOBBINS IN A FLYER FRAME

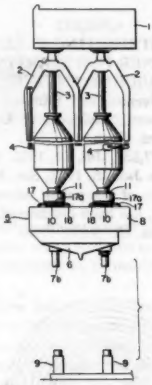
Hidejiro Araki, Toyoake; Katsumi Nakane, Okazaki, and Susumu Otani, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 27, 1983, Ser. No. 545,966

Claims priority, application Japan, Nov. 2, 1982, 57-192819

Int. Cl.[4] D01H *9/02, 9/08*

U.S. Cl. 57—267 11 Claims



1. A method of exchanging empty bobbins and full yarn packages on a flyer frame having a longitudinal base and in which all of said full yarn packages are disposed after doffing at equally spaced apart locations on an endless conveyor mounted substantially on said base for movement along a horizontal, substantially oval-shaped path in the longitudinal direction of said base, said conveyor extending to, and turning around a sprocket adjacent to an end of said base to provide first and second portions of said conveyor which respectively move towards and away from said base end during movement of said conveyor in one direction, said method comprising moving a horizontally portable bobbin truck to adjacent said base end to substantially align a plurality of laterally and equally spaced apart parallel rows of upright empty bobbins thereon with said longitudinal base for feeding said empty bobbins from said truck onto said conveyor and for feeding said full yarn packages from said conveyor onto said truck; grasping and moving a first of said rows of empty bobbins from said truck to deposite within an empty bobbin supply box adjacent to said second portion of said conveyor for subsequent substantially automatic feeding of said bobbins one at a time on to said second conveyor portion responsive to said conveyor movement, then displacing said truck transversely with respecti to said longitudinal base a distance substantially equal to said spacing between said bobbin rows thereon, moving a plurality of said full yarn packages from said conveyor first portion to deposit them within a row substantially corresponding to said first bobbin row on said truck, then grasping and moving a second of said rows of empty bobbins from said truck to deposit within said empty bobbin supply box, again displacing said truck said distance in said transverse direction, repeating said steps of grasping and moving the third and fourth of said rows of empty bobbins from said truck and moving a plurality of said full yarn packages from said first conveyor portion to deposit in rows corresponding to said second and third bobbin rows on said truck, and repeating the last said repeating step with respect to any remaining empty bobbin rows on said truck until all of said empty bobbins have been removed and substantially replaced by corresponding rows of said full yarn packages.

2. Apparatus for exchanging empty bobbins and full yarn packages on a flyer frame having a longitudinal base and an end, and an endless conveyor mounted substantialiy on said base for movement along a horizontal, substantially oval-shaped path extending substantially to said flyer frame end, said conveyor having a sprocket adjacent to said end and providing first and second portions of said conveyor which move respectively towards and away from said end during movement of said conveyor in one direction, said apparatus comprising a bobbin supply unit adjacent to said conveyor second portion for feeding empty bobbins one at a time in upright position onto the latter responsive to said movement of the conveyor, a movable bobbin truck having a plurality of bobbin holders arranged in laterally and equally spaced apart parallel rows for supporting said empty bobbins and said yarn packages in upright positions thereon, an intermittent feed unit adjacent to said flyer frame end for engaging and positioning said bobbin truck with its said parallel rows of bobbin holders extending substantially in the direction of said longitudinal base and having means for intermittently displacing said bobbin truck in transverse direction with respect to said longitudinal base sequential distances substantially equal to said lateral spacing between said rows of bobbin holders, an empty bobbin transport unit adjacent to said flyer frame end and having means for grasping a row of empty bobbins from one of said rows of bobbin holders and transporting the same to said bobbin supply unit, means for depositing said empty bobbins in said bobbin supply unit from said empty bobbin transport unit, a full yarn package transfer unit adjacent to said flyer frame end and substantially transversely adjacent to said empty bobbin transport unit whereby said intermittent displacing movement of said truck moves each successive row of said bobbin holders from beneath said empty bobbin transport unit to beneath said full yarn package transfer unit, means for feeding a row of full yarn packages from said first conveyor portion into said full yarn package transfer unit responsive to said movement of said conveyor, said full yarn package transfer unit having releasable grasping means for receiving said row of full yarn packages including means for positioning the respective packages in said row over, and depositing the same on the respective of said bobbin holders in a row thereof on said bobbin truck, and means for coordinating the operations of said conveyor, said intermittent feed unit, said empty bobbin transport unit, and said full yarn package transfer unit for alternately and sequentially transporting empty bobbins from one row of bobbin holders on said bobbin truck to said bobbin supply unit, displacing said bobbin truck said distance, and depositing said row of full yarn packages from said full-yarn package transfer unit on to said one row of bobbin holders.

4,548,030

OPEN END YARN SPINNING APPARATUS HAVING ROTOR CLEANING MEANS

Dieter Lauschke, Geislingen, and Wolfgang Feuchter, Deggingen-Reichenbach, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 600,519

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313926

Int. Cl.[4] D01H *7/885, 11/00*

U.S. Cl. 57—302 21 Claims

1. An open end yarn spinning apparatus comprising

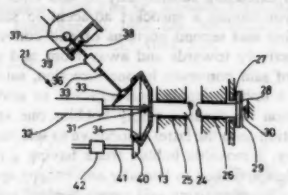
a circular spinning rotor having a rotor shaft coaxially fixed thereto,

bearing means including an aerodynamic thrust bearing rotatably mounting said rotor shaft,

selectively operable drive means for rotating said rotor and rotor shaft,

cleaning means mounted for selective introduction into the open side of said rotor upon disengagement of said drive means, and

biasing means for applying an axial force to said rotor and rotor shaft in a direction to reduce the load applied to said



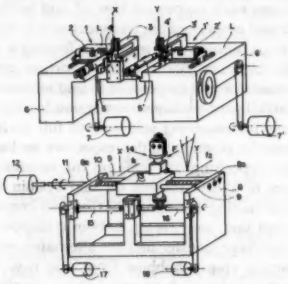
thrust bearing and thereby avoid undue wear of said thrust bearing during operation of said cleaning means.

4,548,031

MACHINE FOR PRODUCING ORNAMENTAL CHAINS MADE UP OF LINKS OF DIFFERENT FORMS AND/OR DIMENSIONS CONNECTED IN ANY PROGRAMMABLE SEQUENCE

Bucefari Massimo, and Lazzarini Michele, both of Arezzo, Italy, assignors to I.C.M. S.p.A. Italiana Costruzioni Metalmeccaniche, Arezzo, Italy

Filed Jun. 27, 1983, Ser. No. 508,262
Claims priority, application Italy, Jul. 7, 1982, 9460 A/82
Int. Cl.⁴ B21L *7/00*
U.S. Cl. 59—16 **14 Claims**



1. A machine for the manufacture of ornamental chains made up of links of different forms and/or sizes arranged according to any programmable sequence, comprising:

at least two independent stations for the formation of the chain (1, 1'), each station including a unit for forming the links (2, 2'; 3, 3') from wire, and a unit for forming the chain itself (4, 4'; 5, 5') from said links, each of said stations being provided with its own driving means and operating according to alternate working cycles of variable length, in accordance with a preset, variable program;

mobile means for intermittently sliding between said stations, said sliding movement being concomitant with the end of one of said cycles in one station and with the beginning of another of said cycles in another station, according to said program;

a take-up unit (14) carrying pliers 27 integral with said mobile sliding means (13) for taking-up, transferring and delivering the chain being manufactured from one formation station to another, said take-up unit being pivotably supported, by said mobile sliding means, about an axis parallel to the direction of said sliding movement;

guide means (28) for said chain being produced, integral with said take-up unit (14);

drive means (37, 38, 39, 43, 67, 72), for said take-up unit, independent of said drive means for each of said stations and activated at the end and at the beginning of each of said work cycles within said stations according to said program, for controlling the opening and the closure of said pliers (27) in the phase in which they pick up the last link of the chain being formed and during the phase of delivery to the various stations, said take-up unit drive means providing for them movements of approach and removal in the direction of a station, in coincidence with said phases, said take-up unit drive means (67, 72) further controlling the release of said last link from the formation station (1, 1') at the end of its work cycle, simultaneously with the take-up of said link by the take-up unit (14).

4,548,032

METHOD OF DISTRIBUTING FUEL FLOW TO AN ANNULAR BURNER FOR STARTING OF A GAS TURBINE ENGINE

Domingo Sepulveda, Vernon, and Edmund E. Striebel, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 287,852, Jul. 29, 1981, Pat. No. 4,417,439.
This application Jul. 25, 1983, Ser. No. 516,508
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.⁴ F02C *7/26*
U.S. Cl. 60—39.06 **2 Claims**

1. The method of starting a gas turbine engine of the type that includes an annular combustor that receives a predetermined total amount of fuel during said starting condition, a plurality of dual fuel nozzles symmetrically disposed about the circumference of the annular combustor, and an igniter adjacent to at least one of said dual fuel nozzles, and each dual fuel nozzle includes a primary fuel system and a secondary fuel system being supplied a given amount of fuel, including the steps of:

calculating the amount of fuel to be supplied to the igniter fuel nozzle from data established from said gas turbine engine to achieve starting, and the amount of fuel to be supplied to the remaining dual fuel nozzles,

redistributing said given amount of fuel for said starting condition to all of the primary fuel systems of all of said duel fuel nozzles to provide the amount of fuel ascertained from the above previous step, so that the calculated amount of fuel to the igniter fuel nozzle is greater than the calculated amount delivered to each of the adjacent dual fuel nozzles, and

initiating starting of the gas turbine engine with the preascertained amount of fuel.

4,548,033

SPACECRAFT OPTIMIZED ARC ROCKET

Gordon L. Cann, P.O. Box 279, Laguna Beach, Calif. 92652

Division of Ser. No. 506,876, Jun. 22, 1983,. This application May 9, 1984, Ser. No. 608,354
Int. Cl.⁴ H05B *7/00*
U.S. Cl. 60—203.1 **4 Claims**

1. A thruster apparatus having a longitudinal axis comprising:

(a) an arc section comprising:

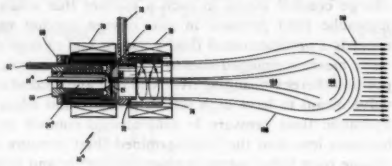
(i) an elongated cathode;

(ii) an annular buffer electrode at least partially surrounding said elongated cathode, said buffer electrode comprising an anode;

(iii) said elongated cathode including a tip spaced from an end of said buffer electrode to thereby define a gap therebetween, and

(iv) a first flow path for fuel flow including a passageway in said buffer electrode opening in a direction upstream of said gap along said axis;

(b) an accelerator section comprising:



(i) a substantially annular anode entirely downstream of said arc section along said axis and being separated from said buffer electrode by an insulating gap of open space, and

(ii) a second flow path for fuel flow opening into a chamber formed within said accelerator section anode;

(c) said thruster apparatus further including:

(i) an accelerating magnet in substantially surrounding relation to said arc section, and

(ii) a focusing magnet in substantially surrounding relation to said accelerator section.

4,548,034

BYPASS GAS TURBINE AEROENGINES AND EXHAUST MIXERS THEREFOR

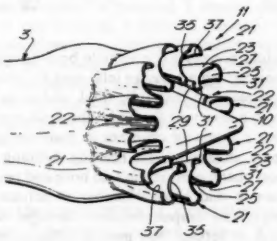
Addison C. Maguire, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 9, 1984, Ser. No. 598,153

Claims priority, application United Kingdom, May 5, 1983, 8312307

Int. Cl.⁴ F02K *1/38*; F01N *1/14*

U.S. Cl. 60—262 **4 Claims**



1. A bypass gas turbine aeroengine having an exhaust mixer nozzle of the multi-lobed type for combining the turbine exhaust gas stream and the bypass air stream with each other before exit of the combined streams from a final propulsion nozzle, the aeroengine further including:

a final turbine stage comprising a stage of turbine rotor blades without outlet guide vanes such that the turbine exhaust gas stream issues from the final turbine stage with a substantial swirl component of velocity;

a turbine exhaust duct for conducting said turbine exhaust gas stream from said final turbine stage to said exhaust mixer nozzle, said turbine exhaust duct being a diffuser over all the distance between said final stage of turbine blades and said exhaust mixer nozzle, and;

an exhaust bullet which defines the inner boundary of the turbine exhaust duct;

said lobes of said exhaust mixer nozzle having axially rearmost extremities which together define a downstream end of said exhaust mixer nozzle, each of said lobes comprising a pair of mutually confronting side walls wherein, to counter said swirl component of velocity in said turbine exhaust stream, one of said side walls of each of said lobes is configured to allow portions of said turbine exhaust gas stream to effuse therefrom in directions generally contrary to said swirl component of velocity to thereby produce in said turbine exhaust gas stream a mean flow direction which is substantially axial at said downstream end of said exhaust mixer nozzle, said one of said side walls of each of said lobes having a downstream edge which is cut back from said downstream end of said exhaust mixer nozzle, said downstream edge thereby defining a notch or scallop shape having a wide end thereof at said downstream end of said nozzle and a narrow end thereof a substantial distance upstream of said wide end, said effusion of said turbine exhaust stream in said direction generally contrary to said swirl component of velocity occurring through said notch or scallop shape.

4,548,035

HYDRAULIC CONTROL APPARATUS FOR A SERVOMOTOR

Svend E. Thomsen, and Thorkild Christensen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

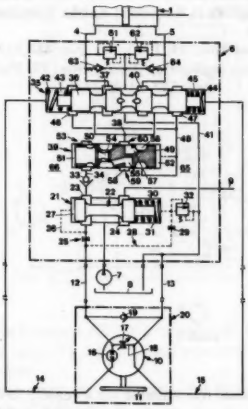
Filed Nov. 12, 1982, Ser. No. 441,105

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1981, 3146302

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 60—384 **6 Claims**



1. A hydraulic steering control assembly, comprising, a bidirectional servomotor having two operating ports on opposite sides thereof, a pump and a tank, a steering wheel operated metering control unit having inlet and outlet ports and left and right control ports to which pressurized fluid may be selectively directed from said inlet port and returned from the other of said control ports to said outlet port, bidirectional valve means having inlet port means and outlet port means connected to said servomotor ports for selectively supplying and exhausting pressurized fluid therefrom, said bidirectional valve means having left turn inlet and outlet control ports and right

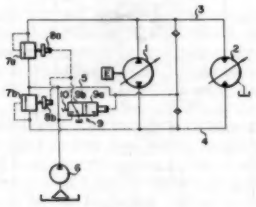
turn inlet and outlet control ports, a two sided control circuit connected to said metering unit control ports and to said bidirectional valve means right and left turn inlet control ports, amplifier valve means having pressure regulating and control and power valve capabilities, said amplifier valve means having a slidable spool disposed in a valve housing having first and second inlet passage means and outlet passage means, said spool and said housing forming first and second chambers at opposite ends thereof, a regulating valve having an inlet connected to said pump and first and second outlets connected respectively to said metering control unit inlet port and said amplifier valve means first inlet passage means, a fixed metering throttle between said regulating valve and said metering control unit having the upstream and downstream sides thereof connected by pressure signal passages to opposite sides of said regulating valve for controlling said regulating valve in accordance with the pressure drop across said metering throttle to effect a substantially constant flow rate between said regulating valve and said metering control unit, a power circuit connected to said pump and to said amplifier valve means first input passage means, said spool having a first internal passage means having fluid communication with said first chamber and being in an adjustable throttling relationship with said first housing inlet passage means to regulate the pressure of said fluid thereat, said bidirectional valve means left and right turn outlet control ports being selectively connected via said metering control unit to said amplifier valve means second chamber and to said valve housing second inlet passage means, said spool having second internal passage means in constant fluid communication with said first internal passage means thereof and said housing second inlet passage means and said valve housing outlet passage means to combine pressure fluids from said control and power circuits, said valve housing outlet passage means being connected to said bidirectional valve means inlet port means to provide a common path for pressurized fluids from said power and control circuits.

4,548,036

HYDROSTATIC TRANSMISSION

Kazuo Matsuda, Kawasaki, and Koichi Morita, Kamakura, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,112
Claims priority, application Japan, Nov. 19, 1981, 56-171377
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—464 **1 Claim**



1. In a hydrostatic transmission for a vehicle having a closed loop hydraulic system hydraulically interconnecting a variable displacement hydraulic pump and a hydraulic motor, said closed loop hydraulic system including a first conduit and a second conduit, the improvement comprising:

a charge pump for charging hydraulic fluid into said closed loop hydraulic system;

charge conduit means interconnecting said charge pump and said closed loop hydraulic system;

first relief valve means connected with said first conduit and having first means responsive to hydraulic fluid pressure in said charge conduit means to change over of said first relief valve means between low and high setting pressures;

second relief valve means connected with said second conduit and having second means responsive to the hydraulic fluid pressure in said charge conduit means to change over setting pressure of said second relief valve means between low and high setting pressures; and

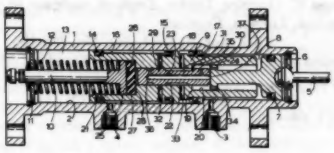
pilot-operated change over valve means disposed between said charge pump and said first and second relief valve means, said change over valve means having a connecting position directly connecting said charge pump to said first and second means and a disconnecting position directly connecting said first and second means to a drain and being operated by the hydraulic fluid pressure in said charge conduit means in such a manner that when the hydraulic fluid pressure in said charge conduit means exceeds a predetermined fluid pressure said change over valve means is changed over to and held at the connecting position thereby changing over said first and second relief valve means to have high setting pressure and when the hydraulic fluid pressure in said charge conduit means becomes less than the predetermined fluid pressure said change over valve means is changed over to and held at the disconnecting position thereof changing over said first and second relief valve means to have low setting pressure.

4,548,037

HYDRAULIC POWER BOOSTERS FOR VEHICLES BRAKING SYSTEMS

Glyn P. R. Farr, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 263,257, May 13, 1981, abandoned, which is a continuation of Ser. No. 937,707, Aug. 29, 1978, abandoned. This application Aug. 8, 1983, Ser. No. 520,757
Claims priority, application United Kingdom, Sep. 1, 1977, 7736466
Int. Cl.[4] B60T *13/20*
U.S. Cl. 60—552 **9 Claims**



1. An hydraulic booster for a vehicle braking system comprising a housing having a bore, an inlet port for connection to a source of high pressure hydraulic fluid, and an exhaust port for connection to a reservoir for hydraulic fluid, means in said housing defining a reservoir chamber in communication with said exhaust port, means in said housing defining a booster chamber, a boost piston working in said bore and responsive to a boost pressure in said boost chamber to actuate a master cylinder assembly, an output member through which said boost piston acts to actuate said master cylinder assembly, a pedal, an input piston-operated by said pedal and exposed at all times to said reservoir chamber, a control valve responsive to an input load applied to said pedal for controlling communication between said inlet port and said booster chamber, and between said booster chamber and said exhaust port, and a reducer mechanism disposed between said control valve and said output member and through which load applied to said master cylinder assembly is fed back to said input piston, said control valve itself constituting thrust transmitting means through which said load is transmitted from said reducer mechanism to said input piston without the provision of additional transmission means, separate from, and independent of, said control valve, whereby said reducer mechanism is adapted to provide, when said booster is operated by said pedal, a

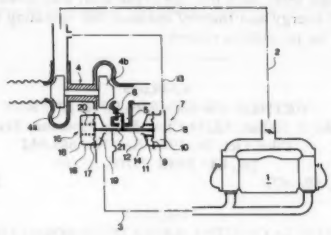
reaction or "feel" at said pedal which is unaffected by the magnitude of said boost pressure.

4,548,038

SYSTEM FOR CONTROLLING THE SUPERCHARGING PRESSURE OF A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Mitsuo Matsuki, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,718
Claims priority, application Japan, Dec. 16, 1982, 57-221348
Int. Cl.⁴ F02B *37/12*
U.S. Cl. 60—602 **4 Claims**



1. A system for correcting the supercharging pressure of an internal combustion engine having a supercharging device, an intake passage, and an exhaust passage, comprising:

said supercharging device comprising a turbine to be driven by exhaust gases and a compressor driven by the turbine,

a bypass for bypassing said turbine;

a valve provided in the bypass;

an actuator comprising a housing partitioned by a first diaphragm into a supercharging pressure chamber and a first atmospheric pressure chamber, the supercharging pressure chamber communicating with the intake passage at the downstream side of the compressor;

first connecting means for operatively connecting said first diaphragm to said valve so as to operate the valve; and

means for offsetting the operating force by the atmospheric pressure in said atmospheric pressure chamber,

said means comprises a housing, a second diaphragm provided in said housing, a vacuum chamber and a second atmospheric pressure chamber defined by said diaphragm, a spring for biasing said second diaphragm toward said second atmospheric chamber, and second connecting means for connecting said second diaphragm to said first diaphragm so as to offset the force by the atmospheric pressure.

4,548,039

TURBOCHARGED INTERNAL COMBUSTION ENGINE

Hans Dinger, Friedrichshafen, and Helmut Klotz, Tettnang, both of Fed. Rep. of Germany, assignors to MTU Friedrichshafen GmbH, Fed. Rep. of Germany

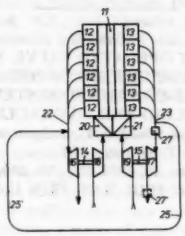
Filed Aug. 22, 1979, Ser. No. 68,579
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2838952; Nov. 14, 1978, 2849302
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—606 **25 Claims**

1. A multi-cylinder internal combustion engine having first cylinders operating during partial load as a combustion engine and second cylinders operating during partial load as a compressor, comprising

at least one supercharging means comprising at least one compressor means operable to supply with charging air the cylinders operating as a combustion engine, and one compressor-drive means,

means for supplying impulse-energy to the one compressor drive means by the use of a compressed gas,

one additional compressor-drive means, and



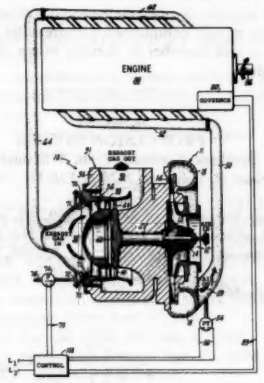
means receiving compressed gas from said second cylinders for supplying compressed gas to the additional compressor-drive means.

4,548,040

METHOD AND APPARATUS FOR DETERMINING WHEN TO INITIATE CLEANING OF TURBOCHARGER TURBINE BLADES

Robert A. Miller, Jeannette, and Edward J. Condrac, North Huntingdon, both of Pa., assignors to Elliott Turbomachinery Company, Inc., Jeannette, Pa.

Filed May 11, 1984, Ser. No. 609,902
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—619 **11 Claims**



1. Apparatus for controlling the cleaning of turbine blades of the turbine portion of a turbocharger powered by exhaust gas which comprises:

high pressure water cleaning means for injecting water into the stream of exhaust gas;

means for sensing a decrease in performance of the turbocharger indicative of the turbine blades becoming dirty and generating a signal in response thereto; and

control means for initiating operation of the water cleaning means in response to the detection of the signal generated by the means for sensing.

6. A method of determining when to initiate water injection for effecting cleaning of dirty turbine blades of the turbine portion of a turbocharger which compresses air for an engine which comprises the steps of:

sensing the pressure of the air being discharged from the turbocharger;

generating a start signal when the pressure of the air being sensed is below a predetermined level; and

initiating water injection to effect cleaning in response to the detection of the start signal.

4,548,041

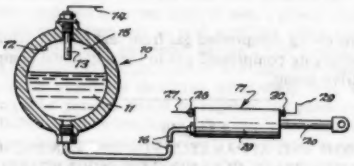
ELECTRICALLY OPERATED VALVE, PISTON AND CYLINDER ASSEMBLY INCORPORATING SAID VALVE, AND SELF-CONTAINED SYSTEM INCLUDING PRESSURIZED FLUID AND HYDRAULIC ACTUATOR

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,778

Int. Cl.[4] F01B *29/08;* **F02N** *13/00*

U.S. Cl. 60—632 **9 Claims**



1. A system for moving a piston comprising a reservoir, compressible liquid in said reservoir, a squib, a cylinder, a chamber in said cylinder, a piston having one end portion in said chamber and its opposite end portion outside of said cylinder, compressible liquid in said chamber, means for selectively firing said squib to compress said compressible liquid in said reservoir, conduit means between said reservoir and said chamber, valve means in said conduit means, and actuating means for selectively opening said valve means to selectively permit flow of said compressed compressible liquid from said reservoir to said chamber to thereby move said piston out of said cylinder.

4,548,042

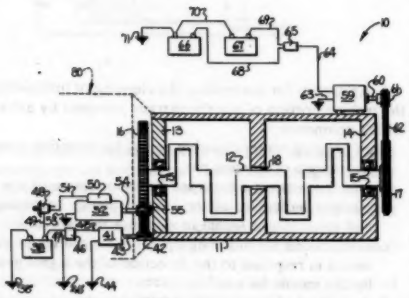
PROPULSION SYSTEM

Luther C. Brothers, Seminole Trail, Wilmington, N.C. 28403, and Michael R. Leimone, 2020 H Fall Dr., Wilmington, N.C. 28401

Continuation-in-part of Ser. No. 399,345, Jul. 19, 1982, abandoned, which is a continuation of Ser. No. 123,174, Feb. 10, 1980, abandoned. This application Apr. 3, 1984, Ser. No. 596,256

Int. Cl.[4] B60K *1/00*

U.S. Cl. 60—668 **8 Claims**



1. An electrical vehicular propulsion system formed by retrofitting a conventional internal combustion propulsion system and comprising:

a conventional internal combustion engine block from which the pistons, valves and other related parts that mechanically interact with the crank shaft thereof have been removed;

a conventional internal combustion engine crank shaft of the type normally associated with said engine block;

low friction bearings at the respective ends of said engine block for mounting said crank shaft for freewheeling rotation within the block;

an electrical drive motor mechanically linked to said crank shaft for imparting rotational movement to the crank shaft about the rotational center thereof;

electrical battery means for powering the drive motor;

a drive train operatively connected to said crank shaft;

said crank shaft including portions offset from the rotational center thereof serving as flywheights during rotation of the crank shaft, such that the crank shaft may store mechanical energy and thereby enhance the operating efficiency of the propulsion system.

4,548,043

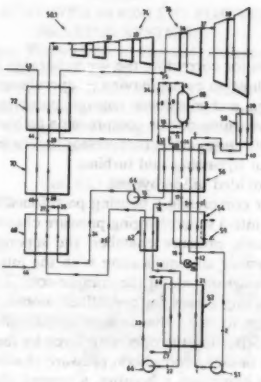
METHOD OF GENERATING ENERGY

Alexander I. Kalina, 12214 Clear Fork, Houston, Tex. 77077

Filed Oct. 26, 1984, Ser. No. 665,042

Int. Cl.[4] F01K *25/06, 25/10*

U.S. Cl. 60—673 **23 Claims**



1. A method of generating energy which comprises:

(a) subjecting at least a portion of an initial composite stream having an initial composition of higher and lower boiling components, to distillation at an intermediate pressure in a distillation system to distill or evaporate part of the stream and thus generate an enriched vapor fraction which is enriched with a lower boiling component relatively to both a rich working fluid fraction and a lean working fluid fraction;

(b) mixing the enriched vapor fraction with part of the composite stream and absorbing it therein to produce at least one rich working fluid fraction which is enriched relatively to a composite working fluid with a lower boiling component;

(c) generating at least one lean working fluid fraction from part of the composite stream, the lean working fluid fraction being impoverished relatively to such a composite working fluid with a lower boiling component;

(d) using a remaining part of the initial composite stream as a condensation stream;

(e) condensing vapor contained in the rich and lean working fluid fractions to the extent that it is present;

(f) increasing the pressures of the rich and lean working fluid fractions in liquid form to a charged high pressure level;

(g) feeding the rich working fluid fraction and the lean working fluid fraction separately to a first evaporator

stage to heat the lean working fluid fraction towards its boiling point, and to evaporate at least part of the rich working fluid fraction;

(h) mixing the lean and rich working fluid fractions to generate a composite working fluid;

(i) evaporating the composite working fluid in a second evaporator stage to produce a charged composite working fluid;

(j) expanding the charged composite working fluid to a spent low pressure level to transform its energy into usable form; and

(k) condensing the spent composite working fluid in an absorption stage by cooling and absorbing it in the condensation stream at a pressure lower than the intermediate pressure to regenerate the initial composite stream.

4,548,044

METAL HYDRIDE CONTAINER AND METAL HYDRIDE HEAT STORAGE SYSTEM

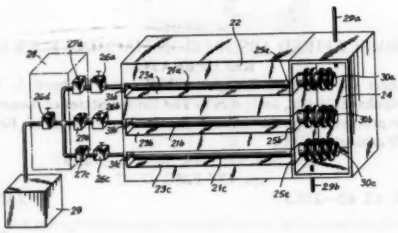
Takashi Sakai; Naojiro Honda, and Ikuo Yonezu, all of Hirakata, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 418,029, Sep. 14, 1982, Pat. No. 4,510,759. This application Dec. 14, 1984, Ser. No. 681,504

Claims priority, application Japan, Sep. 17, 1981, 56-145601; Sep. 17, 1981, 56-145602

Int. Cl.⁴ F17C *11/00*

U.S. Cl. 62—48 **1 Claim**



1. A metal hydride heat storage system, comprising:

a plurality of metal hydride containers, each comprising a heat pipe of annular cross-section, a metal hydride in a central cavity of said heat pipe, closure members closing opposite ends of the central cavity, a heat exchange unit, and a hydrogen passage tube fitted into an aperture defined in one of said closure members and communicating with the central cavity of said heat pipe through a partition member pervious to hydrogen gas and impervious to said metal hydride;

an insulating body adapted to support said metal hydride container;

a heat exchanger containing a heat medium in contact with said heat exchange units of said metal hydride containers;

a hydrogen gas distributor; and

a hydrogen storage tank;

said hydrogen passage tubes of said metal hydride containers being disposed in communication with said hydrogen gas distributor and hydrogen storage tank and having at least a shut-off valve therein.

4,548,045

METHOD FOR CONTINUOUSLY PRODUCING POP-SHAPED FROZEN CONFECTIONS

Romulo A. Altares, Mercerville, N.J.; David S. Gibson, Madison, Wis.; Michael A. Goyda, Newark, Del.; Joseph L. Hegadorn, Ridgewood, N.J., and Virendra N. Kapoor, Mount Kisco, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,077

Int. Cl.⁴ F25D *13/06*

U.S. Cl. 62—63 **6 Claims**

1. A method for continuously producing pop-shaped frozen confections at line speeds exceeding 20 cycles per minute, said frozen confections having a relatively uniform ice crystal size from top to bottom, said method comprising:

(a) providing an endless conveyor system said conveyor system transporting a series of uniformly spaced, depending, pop-shaped, metal molds;

(b) filling said molds with a flowable confectionery material such that the top portion of the molds remain unfilled;

(c) conveying said partially filled molds into a freezing zone wherein the outer surface of the metal molds is in direct contact with a refrigerated liquid having a temperature above −50° C.;

(d) inserting a stick into each filled mold in said freezing zone while the confectionery material is in a partially frozen state;

(e) flowing a liquid cryogen having a temperature below −75° C. into each of the partially filled molds present in said freezing zone, the added cryogen being in an amount sufficient to cover the exposed surface of the confectionery material and to completely freeze the top segment of the confectionery material contained in the mold;

(f) allowing the liquid cryogen contained in the molds to vaporize;

(g) removing the molds from said freezing zone;

(h) removing the completely frozen pop-shaped confections from each mold;

(i) completely immersing each frozen confection in a water bath in order to form an encapsulating ice shell about each confection; and

(j) packaging the ice-coated frozen confections.

4,548,046

THERMODYNAMIC APPARATUS FOR COOLING AND HEATING BY ADSORPTION ON A SOLID ADSORBENT AND PROCESS FOR USING THE SAME

Bernard Brandon, Villeurbanne; André Bailly, Decines, and Francis Meunier, Igny, all of France, assignors to Centre Technique des Industries, Orsay and Centre National de la Recherche Scientique, Paris, both of, France

Filed Apr. 18, 1984, Ser. No. 601,605

Claims priority, application France, Apr. 22, 1983, 83 06882

Int. Cl.⁴ F25B *7/00*

U.S. Cl. 62—79 **10 Claims**

1. An improved thermodynamic apparatus employing adsorption of a refrigerating fluid on a solid adsorbent, for cooling or heating, comprising:

two interconnected tanks containing a solid compound having a large capacity but a low energy of adsorption, each tank having:

(i) at least one reactor for receiving said adsorbent compound;

(ii) at least one condensor for condensing refrigerating fluid desorbed by the action of a hot fluid passing through adsorbent compound laden with refrigerating fluid;

(iii) at least one evaporator for vaporizing refrigerating fluid adsorbed on the adsorbent compound cooled by a cold circuit;

a hot circuit connectible to the at least one reactor of each of the two tanks for heating and circulating said hot fluid;

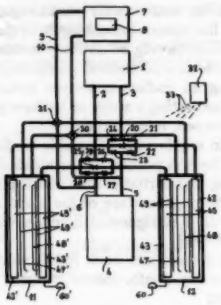
an air-conditioning circuit connectible to the at least one

evaporator of each of the two tanks for cooling an enclosure to be air-conditioned; wherein

said cold circuit is alternately connectible to the at least one condensor and the at least one reactor of the two tanks; and wherein

each tank comprises a one-piece tank, under refrigerating fluid pressure, having:

a plurality of parallel finned tubes covered with adsorbent compounds, forming reactors;



superposed plates parallel to one another and parallel to the tubes at the center of said tank and comprising both said evaporator and said condensor;

at least one anti-radiation screen disposed between the evaporator-condensor and the reactor tubes;

manifolds connecting the reactor tubes and the evaporator-condenser to the inlets and outlets of said circuits.

4,548,047

EXPANSION VALVE

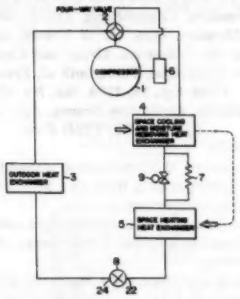
Masakatsu Hayashi, Ibaraki, and Kunio Fujie, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,630

Claims priority, application Japan, Nov. 11, 1981, 56-179674; Nov. 11, 1981, 56-179675

Int. Cl.[4] F16K *31/06*; F25B *41/04, 13/00*

U.S. Cl. 62—160 **5 Claims**



1. An expansion valve for controlling the flow of a refrigerant in the refrigeration cycle of a heat pump air conditioner unit including indoor and outdoor heat exchangers and a four-way valve for changing the direction of flow of a refrigerant in said air conditioner according to space heating, space cooling and dry operation modes, said expansion valve comprising:

a hollow shaft having a first opening connected to said indoor heat exchanger;

a hollow member having a second opening connected to said outdoor heat exhanger and valve port means communicating said first and second openings with each other,

a plunger in sliding engagement in a hollow portion of said hollow member for sliding movement to open and close said valve port means, said plunger being formed of magnetic material at least in part, and said valve port means of said hollow member having an opening extending in a direction of the sliding movement of said plunger, the diameter of the second opening of said hollow member being greater than the length of said valve port means opening in the sliding direction; and

drive means for said plunger; wherein said plunger drive means comprises an electromagnetic coil secured to the outer side of said hollow member, and a circuit for passing an electric current to said electromagnetic coil, said circuit comprising means for supplying pulse signals of high frequency to said electromagnetic coil, said pulse signals being supplied according to different patterns respectively predetermined for space heating, space cooling and dry operation modes, wherein said plunger drive means comprises a permanet magnet in addition to said electromagnetic coil, wherein said valve port means opening is constituted by a single slot extending in the direction of movement of said plunger, wherein said plunger comprises a pressure equalization passageway maintaining two chambers defined between opposite ends of said plunger and said hollow portion of said hollow member in communication with each other, and further comprising an attracting member secured to said hollow portion of said hollow member at an end thereof opposite the end at which said second opening is located whereby the position of said plunger can be controlled by controlling the electric current passed to said electromagnetic coil according to space cooling, space heating and dry operation modes irrespective of whether a refrigerant is introduced into the expansion valve through one or the other of said first and second openings.

4,548,048

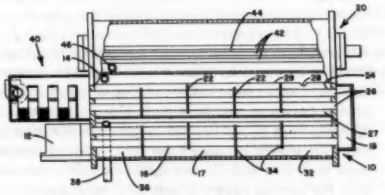
DIRECT FIRED ABSORPTION MACHINE FLUE GAS RECUPERATOR

Robert C. Reimann, Lafayette, N.Y., and Richard A. Root, Spokane, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 13, 1984, Ser. No. 670,097

Int. Cl.[4] F25B *27/02*

U.S. Cl. 62—238.3 **2 Claims**



1. A recuperator for an absorption refrigeration system having a direct-fired generator, a condenser, an absorber, and an evaporator, the recuperator comprising:

a housing secured to the direct fired generator;

a first inlet means and first outlet means formed in said housing, said first inlet means having side walls, a top wall, and a bottom wall, one of said side walls having an aperture therethrough to receive combustion gas flowing from the direct-fired generator, the bottom wall having aperture means therethrough for discharging the received combustion gas, said first outlet means including a blower

for drawing the combustion gas from said first inlet means through said housing to said outlet means;

a means for conducting a cooling fluid through said housing, said cooling fluid conducting means defining a flow path having an inlet, an outlet, side walls, a top wall, a bottom wall, and an intermediate anti-turbulence screen disposed between said top wall and said bottom wall and generally parallel thereto, whereby two opposite side walls have a partition perpendicular therebetween defining a weir spaced between said bottom wall and said anti-turbulence screen to divert said cooling fluid from said inlet through said anti-turbulence screen; and

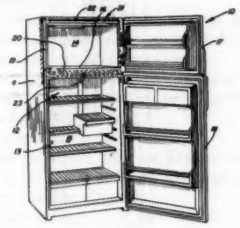
conduit means sealingly aligned with the aperture means of the bottom wall of said first inlet means, said conduit means having an aperture formed therein to define a flow path for the combustion gas to flow from said first inlet means through said cooling fluid and out said first outlet means to a flue.

4,548,049

ANTISWEAT HEATER STRUCTURE

Premkumar Rajgopal, Black Township, Posey County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 8, 1984, Ser. No. 638,972
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—275 **21 Claims**



1. In a refrigeration apparatus cabinet structure having housing walls defining a refrigerated space opening outwardly through an access opening, and a mullion wall extending across said space between said portions of said housing walls, the improvement comprising:

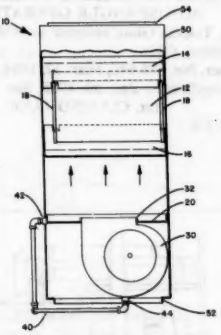
heating means in said cabinet structure for heating said walls to prevent sweating thereon, said heating means being constructed and arranged to provide differential heating of different portions of the walls effectively correspondingly to the tendency for sweating to occur thereon as an incident of the refrigeration of said space, said heating means comprising an elongated resistance heater in at least one of said walls for providing heat therein adjacent said access opening, said resistance heater having a first portion having a first preselected value of electrical resistance per unit length of said heater adjacent juxtaposed portions of said housing and mullion walls, and a second portion connected in series with said first portion and having a second, lower preselected value of electrical resistance per unit length of said heater spaced therefrom, whereby electrical current passed in series through said portions causes a preselected differentially greater heating effect at said juxtaposed wall portions.

4,548,050

HIGH EFFICIENCY FAN COIL UNIT

Alan S. Drucker, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 31, 1983, Ser. No. 499,619
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—291 **7 Claims**



1. A fan coil unit which comprises:

a housing defining an air flow path between an inlet and outlet;

a heat exchanger mounted within the housing to extend across the air flow path;

a blower assembly including a fan scroll and a blower mounted within the housing vertically below the heat exchanger for blowing air through the heat exchanger;

a combination fan deck and condensate pan defining a fan discharge opening for the blower assembly and serving as a condensate collection pan for condensate dripping from the heat exchanger; and

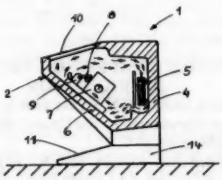
drain means connected to both the combination fan deck and condensate pan and the fan scroll for conducting collected condensate from the combination fan deck and condensate pan and from the fan scroll.

4,548,051

CRYOSTAT MICROTOME APPARATUS

Gerhard Moessner, Nussloch, Fed. Rep. of Germany, assignor to Parke, Davis & Company, Morris Plains, N.J.

Filed Feb. 1, 1983, Ser. No. 462,748
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 8202647[U]
Int. Cl.[4] F25C *5/02*
U.S. Cl. 62—320 **9 Claims**



1. A cryostat microtome apparatus comprising a cooling enclosure; a microtome mounted in said enclosure, refrigeration means operatively connected to said enclosure for cooling the same; a base positioned below said enclosure; support means for providing a vertically adjustable connection between said enclosure and said base, said support means including a plurality of parallel, vertical members and a plurality of

guide members each of said guide members operatively engaging a respective vertical member; said vertical members being mounted on said base and said guide members being mounted on said enclosure.

4,548,052

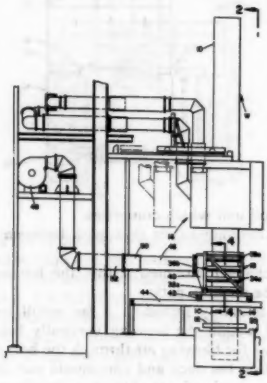
APPARATUS FOR COOLING A STRIP PRIOR TO A MINISPANGLE OPERATION

Max Hoetzl, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 588,646, Mar. 12, 1984, Pat. No. 4,527,506. This application Jan. 30, 1985, Ser. No. 696,541

Int. Cl.⁴ F25D *13/06*

U.S. Cl. 62—374 **8 Claims**



1. A pre-cooler assembly adapted for selectively cooling a continuous strip non-uniformly across its width as the strip travels along a work path disposed in operative communication with the pre-cooler, the pre-cooler assembly comprising:

(a) at least a first nozzle means for directing at least a first band of fluid extending generally across the work path and adapted to impinge transversely against a strip moving therealong for adjusting a temperature distribution across the strip width; and,

(b) a first nozzle restricting means for selectively and in a preselected pattern truncating the first fluid band flowing from the first nozzle means in a non-uniform manner transversely of the work path such that the amount of fluid flow adapted to impinge a strip moving therealong is variable across the strip width, whereby selective non-uniform cooling across the strip width may be obtained.

4,548,053

COMBINED COLD COMPRESSOR/EJECTOR HELIUM REFRIGERATOR

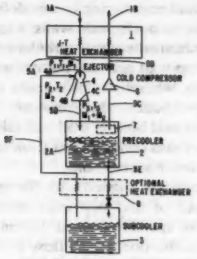
Donald P. Brown, Southold, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,656

Int. Cl.⁴ F25B *1/06*

U.S. Cl. 62—500 **5 Claims**

1. A refrigeration apparatus having a heat exchanger, a precooler, a subcooler and an ejector, all operably interconnected with conduit means that are effective to carry refrigerant; from the heat exchanger to a first input of the ejector, from the output of the ejector to the precooler, from the precooler to both the subcooler and the heat exchanger, as well as from the subcooler to a second input of the ejector, and including the improvement comprising a cold compressor operably connected to reduce the discharge pressure of the ejector,



thereby to improve the operating efficiency of said refrigeration apparatus.

4,548,054

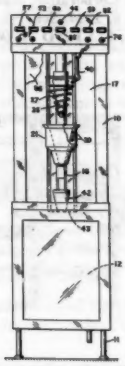
MIXING APPARATUS AND METHOD

Morris M. Levine, Scarsdale, N.Y., assignor to CIC Int'l. Corp., New York, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,019

Int. Cl.⁴ A23G *9/00*

U.S. Cl. 62—342 **6 Claims**



1. An apparatus for blending hard ice cream with at least one condiment comprising a refrigerating compressor and condenser assembly, a funnel for holding the ice cream and condiment therein, a cooling coil in thermal communication with said funnel, said coil being coupled to said refrigerating assembly for freezing the ice cream therein, a funnel motor coupled to said funnel for moving said funnel in linear directions, an auger in alignment with said funnel to be telescoped therewithin during said linear funnel movement, an auger motor for rotating said auger in clockwise and counterclockwise direction, and an electrical circuit for progressively advancing said funnel over said auger as said auger is being rotated until said funnel is telescoped over said auger, said electrical circuit including means connecting with said auger motor and said funnel motor for activating said auger motor and said funnel motor to impart translatory motion to said funnel and reciprocating rotational motion to said auger, said apparatus further comprising a spray head spaced from said auger, a water conduit establishing fluid communication with said spray head and a solenoid valve in said conduit for selectively interrupting said fluid communication therethrough in order to wash said auger and said funnel.

4,548,055

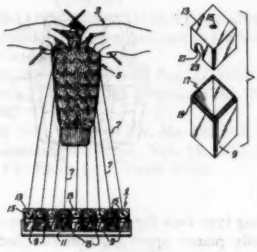
METHOD OF HAND-KNITTING A PATTERNED FABRIC

Anne L. Macdonald, 5606 Mohican Rd., Bethesda, Md. 20816

Continuation-in-part of Ser. No. 410,005, Aug. 20, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 581,893

Int. Cl.[4] D04B *1/10, 3/06*

U.S. Cl. 66—1 A 4 Claims



1. An improved method of hand-knitting a patterned fabric from plural sources of colored yarn without permanent tangling of the yarn strands or need for repositioning the yarn sources during knitting, which method comprises the steps of:

a. providing a yarn source holder including a plurality of discrete containers disposed in a linear array and supported on a common base, with each container having a snug fitting cover with an aperture therethrough;

b. disposing a yarn ball of selected color in each container in the same sequence that the selected color shall appear in the finished fabric;

c. withdrawing the individual yarn strands through the apertures of their corresponding covers and securing the covers on their corresponding containers;

d. working a knit row from the yarn strands wherein each succeeding yarn strand is lifted up and over the previous yarn strand to twist the strands;

e. turning the knitted fabric 180°;

f. working a purl row from the yarn strands wherein each succeeding yarn strand is lifted up and over the previous yarn strand to twist the strands;

g. turning the knitted fabric 180° to return it to its original position;

h. alternating steps d,e,f and g while maintaining the yarn holder in a stationary position and without manipulation of the yarn sources so that the yarn strands that are twisted during the working of a knit row are untwisted during the working of a purl row.

4,548,056

STAMPED KNITTING TOOL FOR KNITTING MACHINES

Bernhard Schuler, Sonnenbühl; Ferdinand Schuller, and Werner Wohlgemuth, both of Albstadt, all of Fed. Rep. of Germany, assignors to Theodor Groz & Söhne & Ernst Beckert, Albstadt-Ebingen, Fed. Rep. of Germany

PCT No. PCT/DE82/00166, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/00706, PCT Pub. Date Mar. 3, 1983

Continuation of Ser. No. 488,544, Apr. 11, 1983,. This PCT application Aug. 14, 1982, Ser. No. 647,261

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133266

Int. Cl.[4] D04B *35/06*

U.S. Cl. 66—121 14 Claims

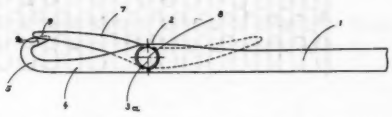
1. A stamped knitting needle for knitting machines having a shank (1) with an intermediate neck (4),

a latch (7) pivotably secured in the shank, and a hook (5) located at the end of the neck, terminating in a hook tip (9), in which the hook tip only is located beneath the end of the latch when the latch is in closed position,

the neck and the hook being made entirely, up to the end portion of the hook, of a shaped, stamped material of rectangular cross section, with the corners at adjacent edges of the sides of the rectangular hook being chamfered (10),

wherein;

the dimensions of the rectangular cross section of the hook



(5), beginning at a maximum value (3) of the cross-sectional dimensions in the vicinity of the neck (4) and in the region thereof adjacent the neck (4), are continuously decreasing, and tapering toward and up to the end of the hook and terminating at the root (9*a*) of the tip (9);

the cross-sectional areas of the continuously tapering dimensionally continuously reduced hook being all of similar shape and configuration, the hook tip (9) being rounded in the region beneath the latch, when the latch is in closed position and the root (9*a*) of the hook tip forming a transition zone from the round tip (9) to the rectangular cross section of the hook (5).

4,548,057

KNITTED FABRIC AND METHOD OF PRODUCING THE SAME

Karl Essig, Reutlingen, Fed. Rep. of Germany, assignor to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Jan. 12, 1983, Ser. No. 457,369

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3203028

Int. Cl.[4] D04B *9/46*

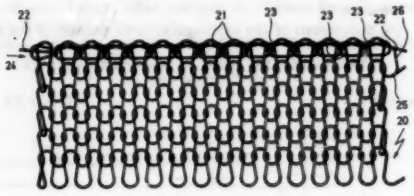
U.S. Cl. 66—172 R 6 Claims

1. A method for producing a knitted single-jersey fabric with a closed terminal seam on a knitting machine comprising two needle beds, stitch forming needles, a racking device, means for transferring the formed stitches from the needle bed where they are formed to the other needle bed, and a needle-selecting device, said method comprising:

(i) forming the selvedge stitches of the knitted fabric on one of the two needle beds;

(ii) transferring the selvedge stitch of the last wale from the needles of the one needle bed which are holding that wale onto the corresponding needle of the other needle bed for racking;

(iii) racking the other needle bed through a needle division step and providing therewith movement of the transferred last selvedge stitch to the level of the adjacent wale with its selvedge stitch;
(iv) transferring the selvedge stitch of the adjacent wale to the needle of the other needle bed;
(v) knitting off both transferred stitches with a thread so as to form a first linking stitch;



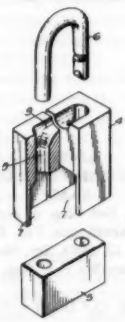
(vi) racking the other needle bed again through a needle division step at the level of the next wale with its selvedge stitch;
(vii) transferring the said selvedge stitch of said next wale to the needle of the other needle bed to the linking stitch found there;
(viii) knitting off said transferred stitch of said next wale and said linking stitch to form a second linking stitch; and
(ix) repeating steps (vi) to (viii) to form a desired number of wales.

4,548,058

PROTECTIVE HASPS FOR A PADLOCK

Avraham Bahry, and Moshe Dolev, both of c/o Rav Bariach Ltd., P.O. Box 465, Yavne, Israel

Filed Nov. 24, 1982, Ser. No. 444,483
Claims priority, application Israel, Nov. 25, 1981, 64355
Int. Cl.⁴ E05B *67/30*
U.S. Cl. 70—56 **4 Claims**



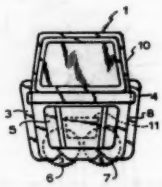
1. A protective hasp for a padlock of the type having a lock body and a separable shackle having depending legs; said protective hasp comprising two complementary formed shells respectively adapted to be attached adjacent respective sides of a door opening; each of said shells when abutting each other having a bottom opening recess for receiving the lock body therein, and downwardly extending channels communicating with said recess and having top openings for receiving the shackle legs therethrough, whereby said channels encase said shackle legs to provide bearing surfaces therefor to lock said door.

4,548,059

PLUG TYPE LOCK FOR BRIEFCASES

Heinz Ruegg, Würenlos, Switzerland, assignor to Huber Italia S.R.L., Valmadrera, Italy

Filed Sep. 28, 1983, Ser. No. 536,910
Claims priority, application Italy, Oct. 8, 1982, 9551/82[U]
Int. Cl.⁴ E05B *65/50*
U.S. Cl. 70—69 **4 Claims**



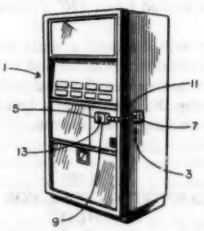
1. A plug type lock for briefcases and the like comprising a substantially planar upper portion attached to a flap of the briefcase having a raised rib in the upper part thereof extending above the plane defined by said upper portion and an element in the lower part thereof outwardly-biased to extend above the plane defined by said upper portion, a lower portion disposed on the corresponding opposite part of the briefcase having a shackle which slidingly receives the upper portion and engages the outwardly-biased element of the upper portion during closure of the lock so as to be closely received between said outwardly-biased element and said raised rib, and a locking mechanism disposed in said upper portion within the region of said outwardly-biased element to lock said element in the outwardly-biased position, said locking mechanism being actuated by at least one combination wheel to effect locking of said lock, said at least one combination wheel being arranged substantially parallel to the plane defined by said upper portion.

4,548,060

LOCKING DEVICE FOR VENDING MACHINES

George T. Campbell, Rte. 2, Box 676, Liberty, S.C. 29657

Filed Nov. 25, 1983, Ser. No. 554,996
Int. Cl.⁴ E05B *65/00*
U.S. Cl. 70—91 **6 Claims**



1. A locking device for an exterior door structure, comprising:
a stationary member pemanently mounted on said door structure, and defining an opening therethrough for receipt of a cylindrical barrel lock;
a passive stationary block permanently mounted on a wall structure adjacent said door structure;
an armored cable connected at one end to said passive stationary block;
an interlocking member connected to the other end of said armored cable and defining an opening therethrough for receipt of said cylindrical barrel lock, said interlocking member slidable interlocking with said stationary member

to provide solid contact surfaces therebetween in all directions but one direction, said one direction providing for sliding engagement and disengagement between said stationary member and said interlocking member; and

a cylindrical barrel lock for receipt within said openings of said stationary member and said interlocking member to preclude movement in said one direction.

4,548,061

CYLINDER-LOCK ATTACHMENT MEANS

Erik A. Nilsson, Eskilstuna, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

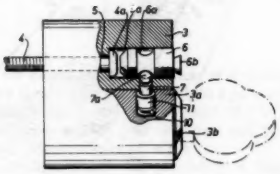
PCT No. PCT/SE81/00333, § 371 Date Jun. 22, 1982, § 102(e) Date Jun. 22, 1982, PCT Pub. No. WO82/01733, PCT Pub. Date May 27, 1982

PCT Filed Nov. 11, 1981, Ser. No. 395,062

Claims priority, application Sweden, Nov. 14, 1980, 8008019

Int. Cl.[4] E05B *9/08*; F16B *41/00*

U.S. Cl. 70—370 **11 Claims**



1. A cylinder lock attachment-fitting comprising:

(a) an escutcheon (**2**);

(b) a cylinder lock (**3**) including a cylinder plug (**3***a*);

(c) one or more headed screws (**4**) for securing the cylinder lock;

(d) one or more holes (**5**) for respective screws, said holes having a widened portion (**5***a*) in which the head (**4***a*) of the respective screw seats,

(e) a screw-head (**4***a*), a plugging element (**6**) anchored in the cylinder lock (**3**), said plugging element being so arranged that it can only be removed to provide access to said screw heads (**4***a*) for loosening said screws (**4**) when the plug (**3***a*) of the cylinder lock has been rotated to a given position of rotation by means of a key belonging to the lock, said plugging element (**6**) comprising a means at least partly covering one or more screw heads, and a recess in the form of a peripherally extending waisted portion (**6***a*) of concave profile, and

(f) a latching means (**7**) retractable into a radial hole (**9**) in the cylinder plug and having an end (**7***a*) for coaction with said waisted portion (**6***a*).

4,548,062

SECURITY DEVICE FOR PREVENTING SEPARATION OF A LOCK FROM A DOOR

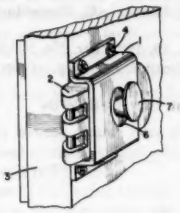
Lazar Kaufman, 454 Ft. Washington Ave., Apt. #50A, New York, N.Y. 10033

Filed Oct. 12, 1982, Ser. No. 433,657

Int. Cl.[4] E05B *63/00*

U.S. Cl. 70—417 **3 Claims**

1. A plate for preventing separation of a lock from a surface of a side of a door to which the lock is independently mounted, the plate being independent from the lock and the lock being mountable to the door without the plate, the plate including a recessed portion and at least two flange portions adjacent the recessed portion, each flange portion having at least one hole therethrough, the recessed portion and the flange portions being configured so that the flange portions seat on the door surface adjacent sides of the lock with the recessed portion covering at least part of the lock, the plate being mountable to



the door by fasteners passed through the holes in the flange portions.

4,548,063

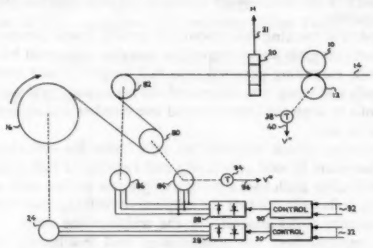
TENSION CONTROL IN A METAL ROLLING MILL

Howard N. Cox, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Jun. 25, 1984, Ser. No. 624,137

Int. Cl.[4] B21B *37/02, 37/06, 39/02*

U.S. Cl. 72—16 **8 Claims**



1. In a rolling mill including a pair of opposed work rolls for reducing the thickness of a workpiece passed therebetween and a delivery system for supplying the workpiece to said work rolls, a method for compensating for anticipated variations in the tension in the workpiece at the entry side of the work rolls occasioned by variations in workpiece thickness comprising:

(a) variably supplying torque to said delivery system to thereby control the tension in the workpiece entering between the work rolls;

(b) defining sequential segments of prescribed length of said workpiece;

(c) determining the time at which a defined workpiece segment enters between said work rolls;

(d) determining any differential in workpiece thickness within a defined workpiece segment;

(e) determining an anticipated rate of change in velocity in the workpiece at the entry side of said work rolls resulting from any differential workpiece thickness determined; and

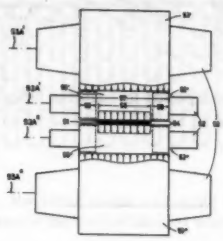
(f) adjusting the torque supplied to said delivery system coil as a function of said anticipated rate of change in velocity to thereby maintain the tension in said workpiece substantially constant.

4,548,064

STRIP-ROLLING STAND WITH BUILT-IN ROLL-CUTTERS

Heinrich Bohnenkamp, Neuss, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,833
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1982, 8223755
Int. Cl.[4] B21B *28/04*
U.S. Cl. 72—236 6 Claims



1. In a rolling stand including

a frame;

a pair of working rolls mounted on said frame centered on and rotatable about respective parallel axes and defining a nip through which a strip can pass in each of a succession of passes forming a single run so that with each pass the thickness and width of the strip are reduced, said working rolls each having opposite end regions projecting laterally beyond the longitudinal edges of the strip passing through the nip;

respective backing rolls mounted on said frame centered on and rotatable about respective parallel axes, said backing rolls extending generally the full length of said working rolls and being braced toward the nip against said working rolls to urge the latter toward one another and against the strip; and

machining means mounted on said frame for reducing the diameters of said projecting end regions of said working rolls after each pass during a single run so that said working rolls only contact the respective backing rolls along a distance equal generally to the width of the strip;

the improvement comprising that said machining means comprises:

(a) a plurality of supports each juxtaposed to a respective end region of an associated working roll and carrying a material-removing tool engageable with that end region of said associated working roll, means mounting each of said supports for pivotal movement about the axis of the backing roll bearing against said associated working roll, thereby to enable the material-removing tool carried by each of said supports to be moved at least generally radially of the respective working roll, and means mounting each of said supports for translational displacement parallel to the axis of said associated working roll along the respective working-roll end region,

(b) respective pivots defining pivot axes fixed relative to said frame and parallel to the respective working-roll axes,

(c) respective stop elements each extending along an associated one of said working rolls and being mounted for pivotal movement about the respective fixed pivot axis, and

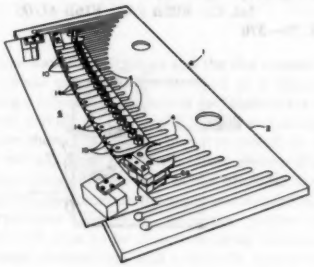
(d) respective eccentric stops carried by and movable with said stop elements, each of said eccentric stops being directed generally away from the respective working roll and toward an associated one of said supports for engagement with the latter, each of said eccentric stops defining, for any given pivoted position of the associated stop element, the radially innermost end position of the respective material-removing tool relative to the juxtaposed end region of the associated working roll.

4,548,065

STRETCH-FORMING TOOL

Richard F. Vyhnal, Tulsa, Okla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 27, 1983, Ser. No. 499,065
Int. Cl.[4] B21D *37/02*
U.S. Cl. 72—413 6 Claims



1. Apparatus for stretch-forming a sheet metal workpiece to a desired contour, said apparatus comprising:

a base plate having a plurality of substantially parallel slots therein, said base plate having a face;

a plurality of forming blocks each having an upper segment and a lower segment, said lower segment having a portion slidably received in one of said slots, said upper and lower segments each having a frontal portion defining respective forming surfaces for said blocks extending transverse to the base plate face;

a template located between respective upper and lower segments of said plurality of forming blocks for establishing therebetween a gap in which a portion of the workpiece is inserted, said template having a configuration substantially conforming to the desired thickness of said workpiece portion and aligning each of the upper and lower segments of each forming block so that the respective forming surfaces thereof define the desired contour;

connecting means extending through registering apertures in said template and in the upper and lower segments of each of said forming blocks for detachably connecting said upper and lower segments together with said template located therebetween, said connecting means having first ends to be received within respective slots for adjustably fixing the positions of said forming blocks along said slots so as to define the desired workpiece contour; and

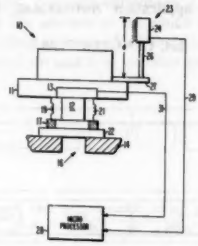
joggle means comprising first and second position variable joggling sections for receiving a portion of the workpiece therebetween, said first joggling section being received by at least one of the slots in said base plate so as to be aligned with said forming blocks, and said second joggling section being movable on the face of the base plate into mating complementary engagement with said first joggling section for forming a deformation in the workpiece corresponding to the desired countour when clamping forces are applied to respective force receiving ends of said joggling sections.

4,548,066

PRESS WORKPIECE THICKNESS MEASURING SYSTEM AND METHOD

Miguel R. Martinez, and William J. Mitchell, Jr., both of Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 7, 1984, Ser. No. 638,551
Int. Cl.[4] G01B 5/06; G01N 3/20
U.S. Cl. 73—1 J **16 Claims**



1. A system for measuring the thickness of a specimen present in a press for forming said specimen into a part comprising:

a force transducer for measuring the force of a forming tool within said press against said specimen and providing a force signal representative of said force;

a displacement transducer for providing a displacement signal representative of the displacement of said forming tool;

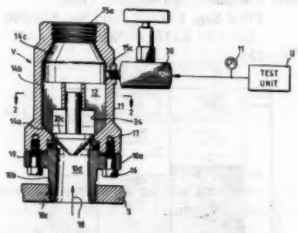
calculator means for receiving said force signal and said displacement signal and providing said specimen thickness in accordance with said displacement signal when said force signal rises above a threshold level in response to contact between said forming tool and said specimen.

4,548,067

METHOD AND APPARATUS FOR TESTING A RELIEF VALVE

J. David Cox, Kilgore, Tex., assignor to Hydro-Seal Valve Company, Inc., Kilgore, Tex.

Filed Apr. 9, 1984, Ser. No. 598,369
Int. Cl.[4] F16K 17/00
U.S. Cl. 73—4 R **4 Claims**



1. An in-service testing apparatus for testing a relief valve while allowing said relief valve to remain operational, comprising:

a system isolator valve adapted to be mounted onto a vessel or pipeline containing system fluid;

said system isolator valve being further adapted to have mounted therewith a pressure relief valve;

said system isolator valve including isolator means for allowing said system fluid pressure to be transmitted to said relief valve under normal operating conditions;

said isolator means further including means for isolating said relief valve from said system fluid in response to the introduction of test fluid into said system isolation valve;

said isolator means further including means for allowing the transmission of system pressure through said isolator valve to said relief valve in response to system pressure attaining an emergency level whereby said relief valve is operable even during testing thereof;

said system isolator valve and said isolator means including a test fluid entry valve, said test fluid entry valve, including:

a valve body having a main bore therethrough, said bore being in fluid communication with said vessel or pipeline and with said relief valve;

a valve element, said valve element including a cylindrical stem portion and a pressure responsive closing element mounted with said cylindrical stem portion;

mount means mounting said valve element for movement between a sealed position and an open position, wherein said valve element in said sealed position seals off said bore in said valve body from said vessel or pipeline to prevent the entry of test fluid into said vessel or pipeline and provide for the testing of said relief valve, said mount means including a cylindrical mounting element and a plurality of radially extending vanes mounted within said bore and supporting said cylindrical mounting element therein; and

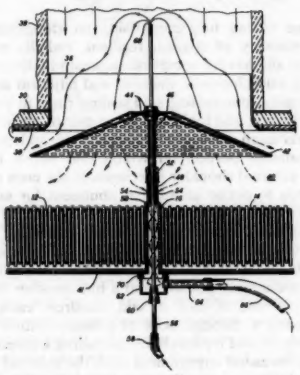
said valve element cylindrical stem portion being mounted for movement in said cylindrical mounting element.

4,548,068

DOWNFLOW AIR FILTER CONSTRUCTION AND METHODS FOR AIR FLOW ADJUSTMENT AND LEAK TESTING THEREOF

Peter J. Gualtieri, Syracuse, and Roger T. Goulet, Liverpool, both of N.Y., assignors to Cambridge Filter Corp., Syracuse, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,611
Int. Cl.[4] G01M 3/22
U.S. Cl. 73—40.7 **15 Claims**



12. A method of leak testing downflow, HEPA-type air filters having a core of pleated filter media separated into two halves by a laterally extending center board and with a box-like enclosure having a top wall above said core to define an enclosed space on the upstream side of said media, said top wall having a centrally disposed opening for admitting air from ductwork connected thereto into said enclosed space for passage through the media, said method comprising:

(a) supporting a damper for adjustable vertical movement with respect to said opening by means of a hollow damper support tube extending coaxially through said opening;

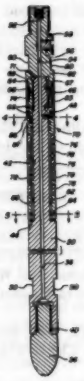
(b) providing a passageway through said center board coaxially with said damper support tube;
(c) inserting the hollow wand of a test smoke generator through said passageway and said damper support tube to position the outlet end of said wand above said damper, outside said enclosed space;
(d) injecting test smoke through said wand to be carried by air flow from said ductwork through said opening and over said damper into said enclosed space; and
(e) scanning the downstream face of said filter core with a detector responsive to the presence of said test smoke at said downstream face.

4,548,069

PIPE TESTING TOOL

Matthew J. A. Nousak, Gray, La., assignor to Dameo Testers, Inc., Houma, La.

Filed Apr. 26, 1983, Ser. No. 488,694
Int. Cl.⁴ G01M *3/28*
U.S. Cl. 73—49.5 **13 Claims**



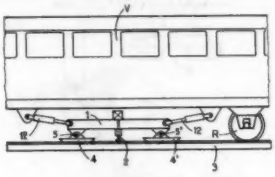
1. A pipe testing tool comprising an elongated member having a plurality of spaced, resilient, radially expandable sealing rings and having compression means including a sleeve surrounding said elongated member and adjacent said sealing rings for axially compressing said sealing rings to cause radial expansion thereof, said tool including a pair of spaced cylindrical mandrels each having a through bore and including a reduced diameter portion on which said sleeve is slidably carried, an external shoulder intermediate the ends of each of said mandrels to define an annular abutment for said sealing rings, an external thread positioned on the outer surface of an outer end of said mandrels and a laterally-extending pressurizing passageway adjacent to but axially spaced from said thread and providing communication between said through bore and said reduced diameter portion, and a hub member threadedly secured to one end of each of said mandrels, each said hub member having a through bore in communication with the through bores of said mandrels and including a threaded internal bore for threaded engagement with the external thread of an associated mandrel, said threaded internal bore including an unthreaded inner end terminating in an inner transverse wall and defining an annular end relief groove extending from said transverse wall and having an axial length defined by the distance between said inner transverse wall and the inner end of said thread, said end relief groove extending radially outwardly beyond said thread in said bore, said hub member including an external cylindrical surface, said sleeve overlapping and in sealing engagement with said cylindrical surface, and an enlarged outer diameter portion at the axial location of said end relief groove for limiting axial movement of said sleeve relative to said hub member, the minimum hub wall thickness between said enlarged diameter portion and said end relief groove being greater than the minimum hub wall thickness at said internal thread.

4,548,070

APPARATUS FOR MEASURING UNDULATORY DEFORMATIONS OF THE ROLLING SURFACE OF RAILROAD RAILS

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,688
Claims priority, application Switzerland, Oct. 18, 1982, 6044/82
Int. Cl.⁴ G01B *7/28*
U.S. Cl. 73—105 **11 Claims**



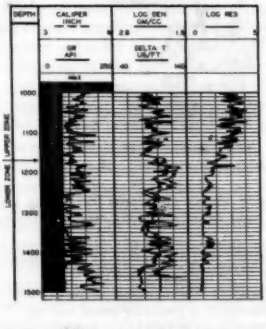
1. Apparatus for measuring undulatory deformations of the rolling surface of rails of a railway comprising a chassis, resting on at least one rail by means of contact members, adapted to be connected to a vehicle traversing the track and comprising at least a detector delivering an electrical signal representing the distances separating a rectilinear reference base defined by the position in space of said chassis and successive points on the surface of the rail line traversed, characterized by the fact that the contact members of the chassis with the rail are constituted by two shoes articulated on the chassis about axes perpendicular to the longitudinal axis of the rail; by the fact that the extent of these shoes in the longitudinal direction of the rail is at least equal to twice the wavelength of the undulatory deformations of the rail of short wavelength, but less than the wavelength of the undulatory deformations of long wavelength.

4,548,071

DETERMINATION OF OIL SHALE YIELD FROM WELL LOG DATA

Robert M. Habiger, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1983, Ser. No. 528,690
Int. Cl.⁴ E21B *49/00*; G01V *1/40*
U.S. Cl. 73—152 **5 Claims**



1. A method for predicting the amount of oil which can be produced from a given volume of oil shale taken from an oil shale formation at a first location comprising the steps of:

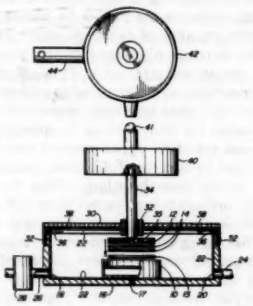
(a) determining the density of the oil shale at said first location (density) from density log data taken at said first location in a bore hole which traverses said oil shale formation;
(b) determining the magnitude of a first variable based on the density determined in step (a);
(c) determining the resistivity of the oil shale at said first location (R) from a resistivity log taken at said first location in said bore hole;
(d) taking the logarithm of the resistivity determined in step (c) to establish a second variable (log R);
(e) predicting the amount of oil which could be produced from a specified volume of oil shale taken from said first location based on said first variable and said second variable.

4,548,072

CONSTANT PRESSURE/G-FORCE DIFFUSION CELL SYSTEM

John M. McAndless, Medicine Hat, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation of Ser. No. 397,354, Jul. 12, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,689
Claims priority, application Canada, Sep. 4, 1981, 385280
Int. Cl.[4] G01N *33/18*
U.S. Cl. 73—159 **9 Claims**



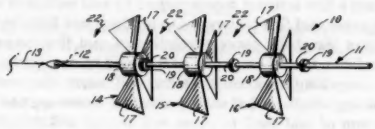
1. An apparatus for monitoring the penetration of vapour from an occluded liquid through a garment material subjected to pressure applied against the garment, comprising:
sample cup means for supporting the entire surface of a stationary sample of said garment material and including means for carrying a liquid
pressure plate means of a suitable porous material, operable in said sample cup means for applying pressure to the entire surface of said sample of garment material;
means for applying a pressure load to said pressure plate means; and
detector means for monitoring the penetration of vapor from said liquid initially occluded by said garment material, sequentially through said garment material and then said pressure plate means.

4,548,073

TROLL METER

Theodore E. Ludden, 191 Solmar Dr., Sequim, Wash. 98382

Filed Apr. 12, 1984, Ser. No. 599,554
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—185 **3 Claims**



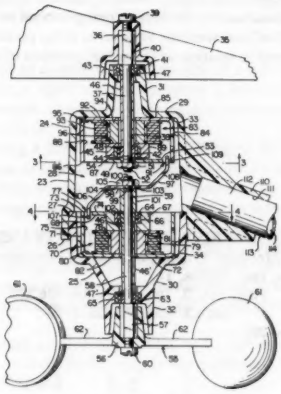
1. A troll meter for boats, comprising, in combination, a shaft, propellers having different pitches received on said shaft, collars received on said shaft, and a line to said shaft.

4,548,074

WIND SPEED AND DIRECTION INDICATOR

Kenneth G. Krueter, 1230 Centennial Dr., Thief River Falls, Minn. 56701

Filed Nov. 9, 1983, Ser. No. 549,909
Int. Cl.[4] G01F *1/05*; G01W *1/02*
U.S. Cl. 73—189 **15 Claims**



1. In a weather vane system for a boat or the like having a weather vane device providing an electrical signal means that is utilized by an indicating means of said system for indicating the wind direction relative to a particular part of said boat or the like carrying said device, said device having a rotatable weather vane and having means operatively associated with said weather vane for producing said signal means, said means for producing said signal means comprising an anemometer that is rotatably carried by said device and is adapted to be rotated by the wind that positions said weather vane, said anemometer having a first means for providing a first electrical current signal for every revolution thereof relative to said particular part of said boat and has a second means for providing a second electrical current signal for every revolution thereof relative to the actual position of said weather vane whereby said first and second electrical current signals are utilized by said indicating means to indicate wind angle relative to said particular part of said boat by said indicating means multiplying 360° by the quotient of the time that elapses between the occurrence of a first electrical current signal and the next second electrical current signal divided by the time that elapses between the occurrence of two successive first electri-

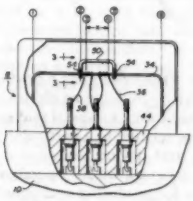
cal current signals whereby said first electrical current signals and said second electrical current signals comprise said electrical signal means, said device having a housing means, said anemometer having a rotatable shaft provided with a section thereof disposed in said housing means, said first means comprising a first electrical coil means disposed in said housing means and a first actuator means carried by said section of said shaft to cause said first coil means to produce said first electrical current signal for every revolution of said first actuator means relative to said particular part of said boat, said second means comprising a second electrical coil means disposed in said housing means and a second actuator means carried by said section of said shaft to cause said second coil means to produce said second electrical current signal for every revolution of said second actuator means relative to the actual position of said weather vane, said first coil means having a first air gap means, said first actuator means causing said first coil means to produce said first electrical current signal each time said first actuator means passes through said first air gap means, said second coil means having a second air gap means, said second actuator means causing said second coil means to produce said second electrical current signal each time said second actuator means passes through said second air gap means, the improvement wherein said first coil means has a fixed tang defining one side of said first air gap means, said second coil means having a movable tang defining one side of said second air gap means, said weather vane having a rotatable shaft provided with a section thereof disposed in said housing means, said movable tang being carried by said section of said shaft of said weather vane so as to be positioned in said housing means in relation to the actual position of said weather vane.

4,548,075

FAST RESPONSIVE FLOWMETER TRANSDUCER

Charles F. Mariano, Framinghani, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 2, 1984, Ser. No. 576,223
Int. Cl.[4] G01F *5/00, 1/68*
U.S. Cl. 73—202 **9 Claims**



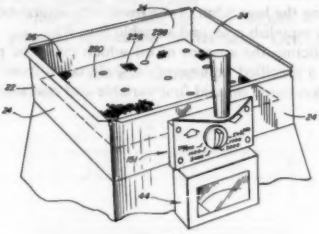
1. In a flowmeter transducer for measuring the flow rate of fluid flowing through the meter, including tubular means defining an elongated flow passage for fluid to be metered and heating means adapted to locally heat said tubular means for thermally obtaining a signal correlated to the flow rate measurements of fluid flowing in said passage; the improvement comprising thermal shunt means mounted in thermal contact on said tubular means in a shunting relation to the locality of said heating means to conduct heat transfer for pursuing a floating flow rate equalization of temperatures between predetermined locations on said tubular means upstream and downstream of said heating means.

4,548,076

AIR FLOW VOLUME MEASURING APPARATUS

Paul F. Haake, Highland Park, and Price R. Hodson, Elmhurst, both of Ill., assignors to Alnor Instrument Company, Skokie, Ill.

Filed Jul. 28, 1983, Ser. No. 517,907
Int. Cl.[4] G01F *5/00*
U.S. Cl. 73—202 **16 Claims**



1. An improved air flow volume measuring apparatus having a housing providing a throat of known cross sectional area; a manifold mounted in the throat and having an upper passage and lower passage with separate entrances from the respective upper and lower passages to the throat, the manifold receiving in the upper passage through the entrances a sample of air flowing down through the throat and exhausting said sample of air through the entrances from the lower passages, and the manifold receiving in the lower passage through the entrances a sample of air flowing up through the throat and exhausting said sample of air through the entrances from the upper passages; an air velocity meter indicating air flow volume as a function of air velocity and having a pipe stub inlet for receiving air and a pipe stub outlet for exhusting air; said improvement comprising:

A. a selector formed of a body having passages and a pocket therein and a cylindrical disk mounted in the pocket and rotatably moveable in the pocket by means of a knob to any one of a plurality of range positions for air upflow through the throat, a plurality of range positions for air downflow through the throat and an off position body having a pipe stub outlet connected to said meter pipe stub inlet and having a pipe stub inlet connected to said meter pipe stub outlet, the body having an upper pipe stub connected to said manifold upper passage and a lower pipe stub connected to said manifold lower passage;

B. said disk having one throttling orifice for each range position, the orifices being spaced from one another, and said disk having a slot separate from said orifices, said body and disk being constructed and arranged so that air from said manifold must pass through one of said orifices free of said slot in transit to said meter and air from said meter must pass through said slot free of said orifices in transit to said manifold during both upflow and downflow of air through said throat.

4,548,077

AMBIENT TEMPERATURE COMPENSATED DOUBLE BRIDGE ANEMOMETER

Antonius F. P. van Putten, Sparrenlaan 90, 5553 CZ Valkenswaard, Netherlands

Filed Mar. 13, 1984, Ser. No. 588,937
Claims priority, application European Pat. Off., Mar. 18, 1983, 83200379.2
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **5 Claims**

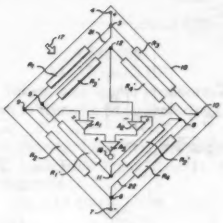
1. An ambient temperature compensated device for measuring the flow velocity of a fluid, comprising

(i) a semiconductor substrate,

(ii) a first electrical bridge disposed on the substrate, the first

bridge having four arms in rectangular disposition, each of the arms having in it an elongate hot film temperature sensitive resistor, the first bridge having connections extending from two of its opposed corners for applying electrical power to the bridge and having connections extending from its two other opposed corners to enable sensing of bridge balance;

(iii) a second electrical bridge disposed on the substrate, the second electrical bridge being similar to the first bridge, the second bridge having its resistors close to and extending side by side with the resistors of the first bridge, the connections



for applying electrical power to the second bridge and the connections for enabling sensing of bridge balance extending from corners of the second bridge which are at 90° relative to the corresponding corner connections of the first bridge;

(iv) means for sensing imbalance of the first bridge and providing a first output signal in response thereto;

(v) means for sensing imbalance of the second bridge and providing a second output signal in response thereto; and

(vi) means responsive to said first and second signals for deriving therefrom a third output signal that is a measure of fluid velocity.

4,548,078

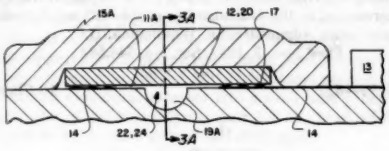
INTEGRAL FLOW SENSOR AND CHANNEL ASSEMBLY

Philip J. Bohrer, Minneapolis; Robert E. Higashi, Bloomington, and Robert G. Johnson, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 429,598, Sep. 30, 1982, Pat. No. 4,501,144. This application Jul. 25, 1984, Ser. No. 634,088

Int. Cl.⁴ G01F *1/68*

U.S. Cl. 73—204 **22 Claims**



1. An integral flow sensor and channel assembly comprising:

a flow sensor having a sensing element integral to a semiconductor body;

support means for supporting the flow sensor, the support means having a first surface;

an enclosed flow channel comprising the first surface formed into a groove running below the sensing element, the flow channel comprising an inlet and an outlet for providing flow across the sensing element, the sensing element being located in the flow channel between the inlet and the outlet;

the support means comprising means for flip-chip mounting the semiconductor body; and

the semiconductor body being flip-chip mounted so that the sensing element is positioned over the groove in the support means.

4,548,079

METHOD AND APPARATUS TO AUTOMATICALLY DETERMINE THE WEIGHT OR MASS OF A MOVING VEHICLE

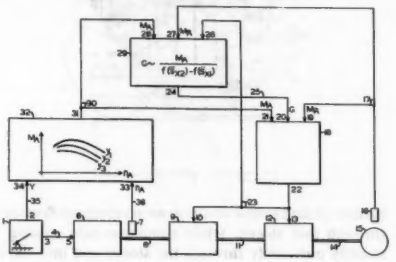
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hannover, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 557,789

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246201

Int. Cl.⁴ G01G *9/00*

U.S. Cl. 73—432 R **31 Claims**



1. A method of determining the weight of a moving vehicle and generating a signal which represents a value corresponding to said weight of said moving vehicle, said method comprising the steps of:

(a) generating a first signal corresponding to the torque on the engine of said moving vehicle at a first point in time;

(b) generating a second signal corresponding to said torque on said engine of said moving vehicle at a second point in time;

(c) genrating a first signal corresponding to the acceleration of said moving vehicle at said first point in time in step (a);

(d) generating a second signal corresponding to said acceleration of said moving vehicle at said second point in time in step (b);

(e) calculating a value representative of said weight of said moving vehicle from said signals generated in steps (a) through (d); and

(f) generating a signal representating said value of said weight calculated in step (e).

4,548,080

METHOD AND APPARATUS FOR SOIL MECHANICS MEASUREMENTS OF FILTER CAKES

Edmund G. F. Sweet, Burlington, Canada, assignor to Ontario Research Foundation, Ontario, Canada

Filed Mar. 28, 1984, Ser. No. 594,116

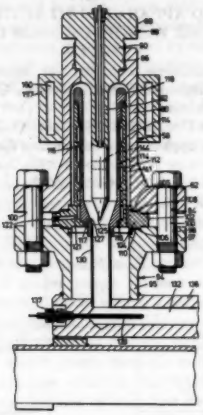
Int. Cl.⁴ E21B *49/10*

U.S. Cl. 73—432 SD **33 Claims**

11. A method of simulating down-hole conditions in a drilled well, comprising the steps:

providing a main housing and a permeable cylindrical sleeve fixed with respect to the main housing and simulating a rock formation through which a well is drilled, together with first means defining a compartment exterior to the sleeve and second means for introducing into the interior of the sleeve a solids-containing fluid, and for increasing the fluid pressure in the sleeve above that in said compartment, whereby some of the fluid passes radially through the sleeve and into said compartment due to a pressure differential across the sleeve, leaving a filter cake on the

inside of the sleeve, a rod-like, elongated probe extending through the sleeve and simulating a drill string,
and adjusting the probe toward and away from the inside



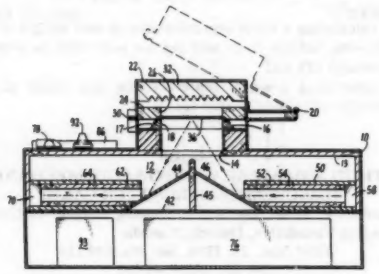
surface of said sleeve to allow an asymmetric flow of fluid through said sleeve, while simultaneously passing fluid radially outwardly through the sleeve and into the compartment.

4,548,081

ULTRASONIC SOFTNESS TESTING SYSTEM

Edward C. Wolthausen, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jul. 20, 1984, Ser. No. 632,924
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—584 **22 Claims**



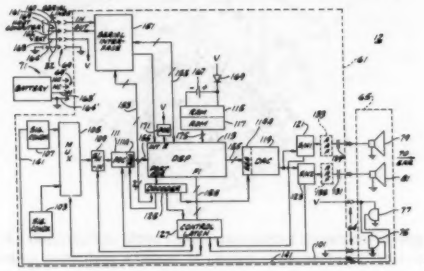
1. Paper softness testing apparatus comprising, in combination:
transmitter means for transmitting ultrasonic energy;
a station for accomodating the paper to be tested;
means for directing the transmitted ultrasonic energy to paper located at said station whereby a portion of the transmitted ultrasonic energy is reflected from said paper as a function of the number of bonding sites per unit area of said paper; and
sensor means for sensing the magnitude of the reflected ultrasonic energy portion;

4,548,082

HEARING AIDS, SIGNAL SUPPLYING APPARATUS, SYSTEMS FOR COMPENSATING HEARING DEFICIENCIES, AND METHODS

A. Maynard Engebretson, Ladue; Robert E. Morley, Jr., Richmond Heights, and Gerald R. Popelka, Ladue, all of Mo., assignors to Central Institute for the Deaf, St. Louis, Mo.

Filed Aug. 28, 1984, Ser. No. 645,004
Int. Cl.[4] H04R *29/00*
U.S. Cl. 73—585 **57 Claims**



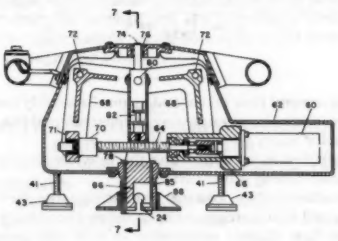
1. A hearing aid comprising:
a microphone for generating an electrical output from sounds external to a user of the hearing aid;
an electrically driven receiver for emitting sound into the ear of the user of the hearing aid; and
means for driving the receiver in a self-generating mode activated by a first set of signals supplied externally of the hearing aid to cause the receiver to emit sound having at least one parameter controlled by the first set of externally supplied signals and for then driving the receiver in a filtering mode, activated by a second set of signals supplied externally of the hearing aid, with the output of the external microphone filtered according to filter parameters established by the second set of the externally supplied signals.

4,548,083

CRYOGENIC INSULATION STRENGTH AND BOND TESTER

Paul H. Schuerer; James H. Ehl, and Willibald P. Prasthofer, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 3, 1983, Ser. No. 548,582
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—827 **15 Claims**



1. Apparatus for determining tensile and bond strength of materials comprising:
a housing;
a load shaft positioned by said housing for longitudinal

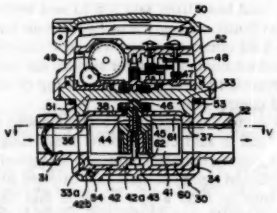
movement, said load shaft adapted to be attached at one end of the material to be tested;
a motor and mechanical means for longitudinally moving said load shaft; and
a portable, self-contained power supply for providing power to said motor and display means;
said housing having a display means for indicating stress experienced by said load shaft when pulling on the material to be tested;
said load shaft having means for providing a signal to said display means of the stress caused by its pulling on the test material.

4,548,084

FLOW METER

Hajime Onoda, Tokyo, and Kunio Arakawa, Urawa, both of Japan, assignors to Kimmon Manufacturing Co., Inc., Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,446
Claims priority, application Japan, Aug. 11, 1982, 57-138409; Aug. 11, 1982, 57-120974
Int. Cl.⁴ G01F *1/075, 1/08*
U.S. Cl. 73—861.81 **9 Claims**



8. A flow meter with a casing having an inlet port, an outlet port, and a measuring chamber containing therein a vane wheel, comprising:
an integral bottomed cylindrical member of synthetic resin including a bottom portion and a side wall portion which is fitted in said measuring chamber so as to be closely in contact with the peripheral wall of said measuring chamber and has an inlet nozzle and an outlet nozzle corresponding to said inlet and outlet ports, respectively; and
a pivot rotatably supporting said vane wheel, said pivot including a tip bearing portion, a shank portion, and a support portion fitted in the center of the bottom portion of said bottomed cylindrical member so as to be supported thereby, said support portion having an extended head, and said pivot being inserted from the outside of the bottom portion of said bottomed cylindrical member into a shaft hole penetrating the center of said bottom portion so that said head is fitted in a spot facing groove around said shaft hole.

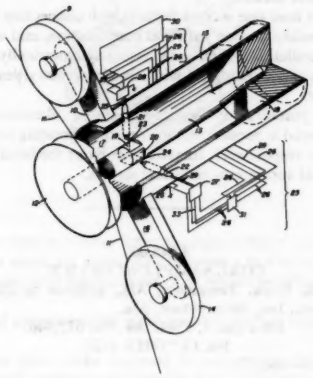
4,548,085

TENSION MEASURING DEVICE AND METHOD FOR FLEXIBLE LINEAR MATERIAL

Reed H. Grundy, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1983, Ser. No. 561,611
Int. Cl.⁴ G01L *5/10, 5/16*
U.S. Cl. 73—862.48 **25 Claims**

1. A tension measuring apparatus for measuring tension in at least two directions for flexible linear material under tension, comprising:
a. an engaging means to contact the flexible linear material,
b. a bending means for providing in conjunction with the engaging means a fixed angle of bend for the flexible linear material,
c. at least one displacement means associated with the engaging means to be displaced in response to the fixed bending angle of the flexible linear material,
d. one or more supports in which the one or more displacement means are fixed,
e. at least two sensing means securely positioned in an angular relationship to each other of other than a linear angular relationship and in a plane substantially parallel to the plane of the strand caused by the fixed angle of bend of the



strand and in sensing engagement with the displacement means,
f. at least one conducting means for conveying at least the signal initiated by the sensing means in response to the displacement of the displacement means,
g. at least one indicating means for indicating the output of the sensing means in order that scaled output can be calculated into the magnitude of the tension reduced by any coefficient of friction for the flexible linear material.

4,548,086

DEFLECTING SPRING

Walter Kästel, Steinen, Fed. Rep. of Germany, assignor to Endress U. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 521,890
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232817
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 73—862.65 **8 Claims**

8. A deflecting spring for distance or force measurement in a force or pressure gauge, comprising
(a) a unitary spring plate containing a pair of oppositely-facing concentrically-arranged generally U-shaped slots **(18,19)** defining in said plate:
(1) an outer clamping section **(6)**;

(2) an inner force-introducing section (1), said inner and outer sections having a given axis of symmetry (S);

(3) at least one intermediate section having portions (4,5) arranged on opposite sides of said force-introducing section, respectively, said intermediate portions being symmetrically arranged relative to said axis of symmetry;

(4) a pair of first flexural webs (10,11) connecting said intermediate portions, respectively, at one end with said inner section;

(5) at least one second flexural web connecting said intermediate section with said outer section, said webs being parallel, said first webs being symmetrically arranged on opposite sides of said axis of symmetry, respectively; and

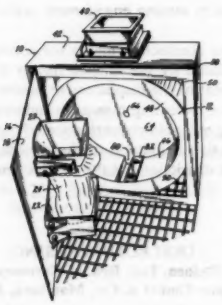
(b) a plurality of flexure-responsive electrical sensors mounted in parallel relation on corresponding faces of said webs, respectively, thereby to convert the bending forces of said spring into electrical signals.

4,548,087

COAL SAMPLING DEVICE

William R. Huck, Tuscaloosa, Ala., assignor to Jim Walter Resources, Inc., Birmingham, Ala.

Filed Jul. 5, 1984, Ser. No. 627,946
Int. Cl.[4] G01N *1/20*
U.S. Cl. 73—863.57 **6 Claims**



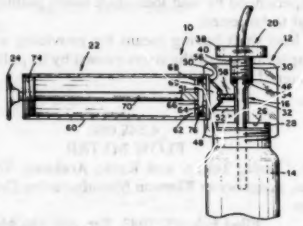
1. A coal sampling device comprising means to create a feed stream a granular material, a housing having a top wall, an open mesh bottom wall, a rear wall, and two side walls and further having a front opening, said top wall having an opening adapted to receive said feed stream of granular material, said rear wall having a circular opening therein, a rotatable drum mounted for axial rotation within said housing, said drum having an open end and a closed end, said closed end being adapted to mate with said rear wall opening to form a partial closure for said rear wall, said drum further having a peripheral upstanding flange along its open end, said drum further having a slot in its periphery across the axial width of the drum, means for inserting and removing a receptacle from said open end of said drum and in registration with said slot when said slot is rotated to the highest position occupied by the rotating drum, said means for inserting and removing a receptacle from said open drum end further comprising a closure for the said open end of said housing, means connected to said drum for rotation thereof, whereby said feed stream flows over and around the outer peripheral surface of said drum located between the rear wall of the housing and said peripheral upstanding flange and when said slot is in alignment with said hopper a selected portion of said feed stream falls into said receptacle in a cyclical manner as the drum rotates.

4,548,088

OIL SAMPLING SYSTEM

James H. Hood, Jr., P.O. Box 10812, Knoxville, Tenn. 37919

Filed Dec. 15, 1983, Ser. No. 562,396
Int. Cl.[4] G01N *1/20*
U.S. Cl. 73—864.34 **14 Claims**



1. An oil sampling system for collecting an oil sample from a receptacle comprising:

a head having a top and a bottom;

a vertically disposed central bore formed in and extending through said head from said top to said bottom;

a collection bottle sealingly attached to said bottom of said head in fluid communication with said central bore;

a flexible tube having an exterior surface for extending from the receptacle to be sampled to said top of said head and into said central bore;

a coupling means for selectively attaching said flexible tube to said head in said central bore comprising seal means having an inside diameter which is selectively decreased to a contracted size to contact said exterior surface of said flexible tube to form a seal between said head and said flexible tube with said flexible tube being in fluid communication with said collection bottle and said inside diameter of said seal means being selectively increased to form a fluid intake from the exterior of the system in the area between said seal means and said exterior surface of said flexible tube and to release said flexible tube to destroy said seal;

vacuum means attached to said head in fluid communication with said central bore for selectively producing a partial vacuum in said central bore and said collection bottle; and

conduit means extending between said vacuum means and said bore to provide fluid communication therebetween;

whereby, said coupling means is operable to release said partial vacuum in said central bore and said collection bottle when said inside diameter of said seal means is increased to form said fluid intake and said flexible tube is released.

4,548,089

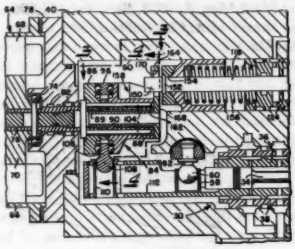
ELECTRO-MECHANICAL DIRECT DRIVE VALVE SERVO SYSTEM WITH ROTARY TO LINEAR VALVE DRIVE MECHANISM

Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Division of Ser. No. 326,536, Dec. 2, 1981, Pat. No. 4,466,597. This application May 2, 1984, Ser. No. 606,195
Int. Cl.[4] F16H *23/00, 57/10*
U.S. Cl. 74—60 **15 Claims**

1. A rotary to linear drive mechanism comprising a rotary input member having an axial planar face inclined to the rotational axis of said rotary input member, a wobble member journaled on said rotary input member for rotation relative to said rotary input member, said wobble member having an axial planar face in axial alignment and bearing engagement with the axial face of said rotary input member, means restraining said wobble member for effecting nutating movement about an axis normal to said rotational axis, means for connecting said wob-

ble member to a linearly movable element for effecting linear movement of said element in response to nutating movement of said wobble member upon rotation of said rotary input mem-



ber, and auxiliary control means responsive to a control input for initially braking rotation of said rotary input member at a controlled rate to a neutral position.

4,548,090

SUPERSONIC VIBRATION DRIVEN MOTOR DEVICE

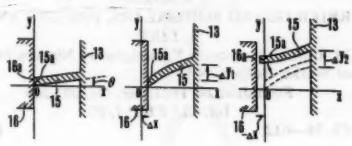
Toshiiku Sashida, 1-8, Kasuya 2-chome, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 343,361, Jan. 27, 1982, abandoned, which is a continuation of Ser. No. 133,309, Mar. 24, 1980, Pat. No. 4,325,264. This application Mar. 12, 1984, Ser. No. 589,034

Claims priority, application Japan, Mar. 19, 1979, 54-31955

Int. Cl.⁴ F16H *27/02, 29/02*

U.S. Cl. 74—88 **2 Claims**



1. A supersonic vibration driven motor device comprising:

a supersonic oscillator; and

a mass to be rotationally driven by way of supersonic vibration,

said supersonic oscillator being provided with a vibration disc secured thereto on an end face thereof which is opposite to said mass to be driven,

said mass to be driven being integrally formed with a plurality of plate-shaped resilient vibratory pieces annularly arranged on an end face thereof opposite to said oscillator and axially extending at a predetermined angle of inclination relative to the axis of the mass to be rotated,

said vibration disc and vibratory pieces being located so that their respective end portions come in contact with one another,

vibratory displacement of the supersonic oscillator being transformed into rotational movement of the mass by the flexible deformation of said vibratory pieces,

the angle of inclination of the vibratory pieces relative to a plane perpendicular to the end face of the mass to be driven being predetermined to be smaller than the friction angle between the vibration disc secured to the supersonic oscillator and the vibratory pieces.

4,548,091

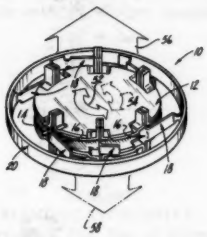
MOTION CONVERTER FOR USE IN TRANSDUCERS AND THE LIKE

Peter Norton, 15612 Hilton, Southfield, Mich. 48075

Filed Sep. 27, 1982, Ser. No. 423,509

Int. Cl.⁴ F16H *21/44*

U.S. Cl. 74—99 R **11 Claims**



1. A motion converter for converting relative angular displacement about a common axis between a pair of input members to linear axial displacement of an output member comprising:

first and second coaxial input members and an output member,

three or more links disposed in circumferentially spaced positions around said common axis, each link being coupled with each input member by means substantially constraining the movement of each link to rotation about a link axis perpendicular to said common axis,

an arm mounted on each of said links and movable therewith,

coupling means for coupling said output member to each of said arms and supporting said output member through said arms for said linear displacement, said output member being spaced from said input members to define a clearance therebetween, said output member being free of contact with said input members over an operating range of said output member,

whereby relative rotation of said input members about said common axis causes linear motion of said output member in the direction of said common axis.

4,548,092

BICYCLE GEAR SHIFT UNIT

Samuel Z. Strong, Jr., R.R. 9, Box 58 Teresa, Columbia, Mo. 65202

Filed Feb. 10, 1983, Ser. No. 465,635

Int. Cl.⁴ B62K *23/02;* **B60K** *20/06, 41/26;* **G05G** *5/08*

U.S. Cl. 74—475 **13 Claims**

1. A gear changing mechanism for use on a bicycle comprising:

a stationary base fixedly mounted on a handlebar of a bicycle, said stationary base having an upper surface with a plurality of indexing means defined therein and a bore defined therethrough;

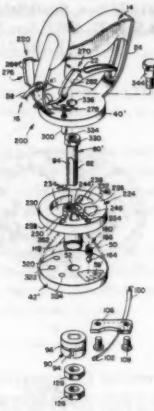
a rotatable base rotatably coupled to said stationary base, said rotatable base having a lower surface engaging said stationary base upper surface, and an upper surface;

a handle fixed to said rotatable base upper surface for rotation therewith;

a gear shift disc coupled by a gear shift cable to appropriate gears on the bicycle;

a bolt attached to said rotatable base and extending through said stationary base bore into engagement with said gear shift disc to couple said disc to said rotatable base for rotation therewith;

fastening means on said bolt for securing said gear shift disc to said bolt; and



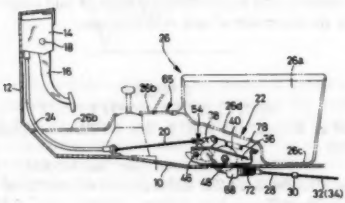
clutch means for disengaging said rotatable base from said shift disc.

4,548,093

INTERMEDIATE-LEVER DEVICE FOR A PARKING BRAKE SYSTEM

Yoshihisa Nomura; Masayoshi Katagiri, and Shigemi Sakakibara, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 29, 1984, Ser. No. 614,758
Claims priority, application Japan, Jun. 8, 1983, 58-102299
Int. Cl.[4] G05G *1/14*; F16C *1/10*
U.S. Cl. 74—512 **19 Claims**



1. An intermediate-lever device for a parking brake system in a vehicle which has a console box disposed between right and left seats thereof associated with an upper surface of a floor panel thereof, the parking brake system including a parking brake control member, a parking brake mechanism, a first brake cable connected at one end to the control member, and a second brake cable connected at one end thereof to the parking brake mechanism, said intermediate-lever device comprising:

an intermediate lever connecting the other end of said first brake cable to the other end of said second brake cable; and

a bracket pivotably supporting said intermediate lever,

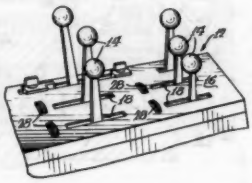
said intermediate lever and said bracket being accommodated in said console box, said bracket being secured to said upper surface of said floor panel of the vehicle.

4,548,094

HANDLE CONTROL ASSEMBLY

Thomas W. Huitema, and David A. DeSutter, both of Racine, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 3, 1983, Ser. No. 471,590
Int. Cl.[4] G05G *5/04*
U.S. Cl. 74—526 **9 Claims**



1. A control arrangement for selectively defining the range of movement of a linearly moveable control handle which extends through a control console cover, comprising:

handle guide means mounted on and beneath said console cover for rotational movement about an axis generally parallel to the direction of linear movement of said control handle, said guide means including operating means projecting through said console cover for rotationally manipulating said guide means about said axis;

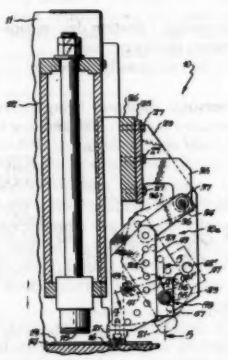
said guide means being configured such that in a first position of said guide means said handle is retained against linear movement in a neutral position within a first opening defined by said guide means, in a second position of said guide means said handle is operable through a range of limited linear movement within a second opening defined by said guide means, said second opening being larger than said first opening, and in a third position of said guide means said handle is operable through a range of relatively greater linear movement.

4,548,095

BARRIER GUARD FOR SHEARS, PRESSES AND THE LIKE

Roy M. Davis, Clarence, N.Y., assignor to Niagara Machine & Tool Works, Buffalo, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,249
Int. Cl.[4] F16P *1/00*
U.S. Cl. 74—612 **11 Claims**



1. In a machine having a frame and a machine surface leading to an area where a movable portion of the machine engages a workpiece, a barrier guard comprising elongated barrier means, a plurality of link means spaced lengthwise of said elongated barrier means, first and second ends on said link

means, first pivotal connections effectively located between said first ends of said link means and said frame of said machine, second pivotal connections effectively located between said second ends of said link means and said barrier means, bracket means, means fixedly mounting said bracket means on said frame of said machine, coacting slot means and follower means between said bracket means and said barrier means and operative in combination with the pivotal action of both said first and second pivotal connections of said link means during operation of said coacting slot means and follower means for guiding the path of said barrier means, and base means on said barrier means for providing progressively greater clearances from said machine surface during relative movement between said barrier means and said bracket means as said base means moves away from said area where said movable portion of said machine engages said workpiece, said slot means comprising a slot located in said bracket means, and said follower means comprising a roller mounted on said barrier means.

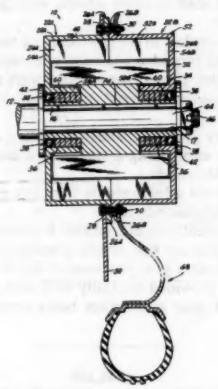
4,548,096
COMPACT FLUID DRIVE TRANSMISSION

Joseph Giocastro, 64-28 Metropolitan Ave., Middle Village, N.Y. 11379; Salvatore Giocastro, 53-11 73 St., Maspeth, N.Y. 11378, and Peter Giocastro, 64-28 Metropolitan Ave., Middle Village, N.Y. 11379

Continuation-in-part of Ser. No. 448,845, Dec. 15, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,086

Int. Cl.[4] **F16H** *35/04, 47/00;* **B60K** *23/00;* **F16D** *31/00*

U.S. Cl. 74—650 **6 Claims**



1. A fluid drive transmission system for an axle member and a wheel of a motor vehicle, comprising in combination;

drum means positioned about said axle member and connected to said wheel, said drum means including a drum member having a cylindrical outer wall and opposed end walls forming a chamber, said drum means including a plurality of drum blades extending radially into said chamber approximately parallel to said axle member, said opposed end walls forming a pair of opposed circular holes and having a pair of inwardly extending opposed hollow cylindrical inner members connected to said end walls at the rims of said holes, said axle member being positioned through said drum member through said hollow inner members, said outer wall being connected to said wheel,

rotor means connected to said axle and positioned within and rotatably connected to said drum means, said rotor means including a plurality of rotor blades extending radially into said chamber parallel to said axle member in closely spaced relationship with said drum blades,

fluid means filling said chamber for passing torque from said rotor blades to said drum blades,

bearing means positioned between said rotor means and said drum means for enabling said rotor member and said drum member to rotate relative to one another,

sealing means associated with said bearing means for sealing said bearing means and for sealing said fluid means in said chamber, and

means for removably connecting said rotor member to said axle member,

whereby said transmission system may be removed as a unit from said axle member without breaking the sealing means.

4,548,097
MANIPULATOR DRIVE

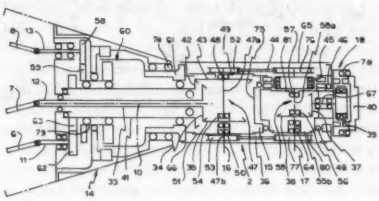
Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,762

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048067

Int. Cl.[4] **F16H** *37/06*

U.S. Cl. 74—665 M **11 Claims**



1. A manipulator drive comprising:

a main support defining a main longitudinal axis;

a housing rotatable on said main support about said main longitudinal axis;

a head defining a head longitudinal axis and rotatable on said housing about an outer transverse axis crossing said main longitudinal axis;

a holder rotatable on said head about said head longitudinal axis;

respective housing, head, and holder stepdown drive transmissions carried respectively in the support, housing, and head and having

respective housing, head, and holder outputs connected directly to said housing, head, and holder and

respective housing, head, and holder inputs, said transmissions having stepdown transmission ratios from their respective inputs to their respective outputs of at least 70:1; and

respective head and holder drive trains including

respective head and holder right-angle drives having input shafts coaxial with said main longitudinal axis and coaxial output shafts defining an inner transverse axis generally parallel to said outer transverse axis but offset along said main longitudinal axis therefrom toward said support,

respective head and holder output members connected to the respective transmission inputs and both rotatable about said outer transverse axis, and

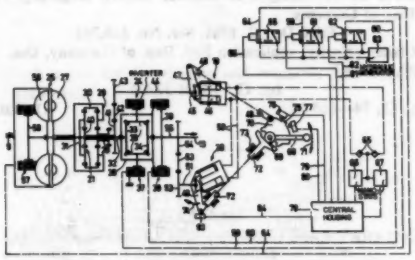
respective head and holder connecting elements between the respective output shafts and output members for joint rotation of each output member with the respective output shaft.

4,548,098

HYDROMECHANICAL TRANSMISSION COMPRISING A HYDROKINETIC COUPLER WHEN NECESSARY IN PARTICULAR FOR DIRECTION OF TRACKED VEHICLES

Bernard Besson, Orsay, and Jacques Guernet, La Celle Saint Cloud, both of France, assignors to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM), Suresnes, France

Filed Oct. 16, 1978, Ser. No. 952,251
Claims priority, application France, Oct. 10, 1977, 77 30454
The portion of the term of this patent subsequent to Oct. 22, 2000, has been disclaimed.
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—687 9 Claims



1. A hydromechanical transmission for driving at continuously variable speed in one direction and reverse direction a steering shaft connected to planetary gear units for transforming torque from an engine to driven wheels respectively engaging both tracks of a tracked vehicle, said transmission comprising in combination:

a gear transmission means connecting an output shaft of said engine to said steering shaft and including a main power dividing planetary gear unit having a first output shaft bearing a sun gear member and a second output shaft connected with planet pinions and reversal means connected to said second output shaft for controlled reversal of the rotation of said steering shaft;

a hydrostatic mechanism comprising a hydrostatic pump unit and a hydrostatic motor unit in a closed hydrostatic circuit and means for varying displacements of said hydrostatic pump unit and said hydrostatic unit,

said hydrostatic pump unit being in mechanical driving relationship with said first output shaft of said main planetary gear unit and said hydrostatic motor being in mechanical driving relationship with said steering shaft downstream of said reversal means, whereby a portion of the torque from the engine is transferred hydrostatically and the balance of the torque is transmitted mechanically; and

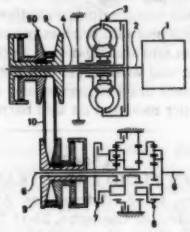
a hydrokinetic coupler unit having a pump member driven by said output shaft of said engine and a turbine member connected to said second output shaft of said main planetary gear unit for selectively transmitting a supplemental torque to said steering shaft.

4,548,099

TORQUE RATIO CONTROL DEVICE FOR A V-BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Robert W. Wayman; Mutsumi Kawamoto, both of Nagoya, and Shiro Sakakibara, Anjo, all of Japan, assignors to Aisin-Warner K. K., Aichi, Japan

Continuation of Ser. No. 202,154, Oct. 30, 1980,. This application Feb. 21, 1984, Ser. No. 581,540
Claims priority, application Japan, Oct. 30, 1979, 54-141032
Int. Cl.[4] F16H *37/00, 37/06*
U.S. Cl. 74—689 7 Claims



1. A variable transmission for automotive vehicles comprising:

(a) an input shaft to be driven by an engine;

(b) a hydraulic torque converter;

(c) an output shaft to drive wheels, arranged parallel to said input shaft;

(d) a V-belt stepless drive ratio shifting means comprising a drive pulley provided coaxially with said input shaft and a driven pulley provided coaxially with said output shaft, said drive pulley and said driven pulley being connected by a belt;

(e) a planetary gear mechanism operating as a reverse shifting means, comprising a sun gear, a carrier, a ring gear, and a double pinion;

(f) a brake to act selectively on said ring gear of said planetary gear mechanism; and

(g) a clutch selectively engageable for connecting an output side with an input side of said planetary gear mechanism, wherein a reduction gear mechanism and a differential gear mechanism are provided coaxially with said output shaft, and said differential gear mechanism being connected with said output shaft.

4,548,100

TRANSMISSION FOR MOTOR VEHICLES

Bernd-Robert Höhn, Kosching, Fed. Rep. of Germany, assignor to Audi NSU Auto Union AG, Fed. Rep. of Germany

Continuation of Ser. No. 374,062, May 3, 1982. This application Sep. 20, 1984, Ser. No. 653,468
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118075
Int. Cl.[4] F16H *37/00, 37/06*
U.S. Cl. 74—689 22 Claims

1. A transmission for motor vehicles comprising:

a case,

a conical-disc band transmission enclosed in said case, said band transmission including an output disc pair and a driving disc pair,

a reduction gear having first and second forward speeds enclosed in said case,

a drive shaft to which one gear of said reduction gear or said driving disc pair of said band transmission can be connected,

a power take-off shaft disposed parallel to said drive shaft, said power take-off shaft being connected to said output disc pair,

an intermediate shaft including at least one gear, said gear

being couplable with gears on said drive shaft and on said power take-off shaft,

said reduction gear including a first pair of gears mounted on said drive shaft for the first and second forward speeds,

said driving disc pair being mounted on said drive shaft,

said intermediate shaft including a second pair of gears for the first and second forward speeds and a fixed gear,

said power take-off shaft including a fixed gear engaging said intermediate shaft fixed gear,

said power take-off shaft fixed gear transferring mechanical power from said drive shaft to said power take-off shaft when said drive shaft is connected to said reduction gear,

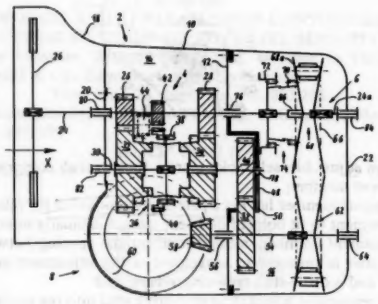
a synchronous clutch for shifting said first pair of gears and said second pair of gears for the first and second forward speeds of said reduction gear,

a differential integrally built into said case,

an intermediate wall positioned in said case and dividing said case into a first compartment and a second compartment,

a bearing means for said drive shaft, said intermediate shaft and said power take-off shaft,

said intermediate wall supporting said bearing means,



a first cover for closing off said first compartment,

said first cover supporting said drive shaft and said intermediate shaft,

a second cover for closing off said second compartment,

said second cover supporting said drive shaft and said power take-off shaft,

said disc band transmission being disposed in said second compartment,

said differential and said reduction gear being disposed in said first compartment,

said intermediate wall including a bulge segment extending into said second compartment, said bulge segment defining a bulge area in said first compartment,

said intermediate shaft including a fixed gear disposed in said bulge area,

said power take-off shaft including a fixed gear corresponding to said intermediate shaft fixed gear and disposed in said second compartment, and

said intermediate shaft fixed gear and said power take-off shaft fixed gear engaging each other through an opening in said bulge segment.

4,548,101

TRANSMISSION MECHANISM WITH PARALLEL TRANSMISSION SYSTEMS INCLUDING TORQUE CONVERTER IN THE FIRST SPEED ONE ONLY

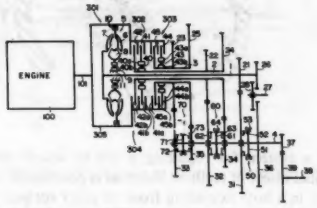
Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 11, 1983, Ser. No. 465,796

Claims priority, application Japan, Jun. 18, 1982, 57-104733

Int. Cl.⁴ F16H *47/00*

U.S. Cl. 74—720 **7 Claims**

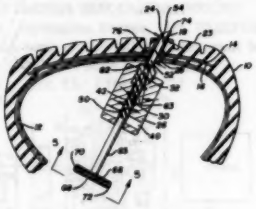


1. A transmission mechanism comprising: a rotational input member; an output shaft; a fluid torque converter; a first on-off clutch; a second on-off clutch; a third on-off clutch; a first one way clutch; a second one way clutch; a first gear train having a first reduction gear ratio; a second gear train having a second reduction gear ratio smaller than said first reduction gear ratio; a third gear train having a third reduction gear ratio smaller than said second reduction gear ratio; a fourth gear train having a fourth reduction gear ratio smaller than said third reduction gear ratio; a first gear train having a fifth reduction gear ratio smaller than said fourth reduction gear ratio; a first synchronizer which connects said input member and said output shaft via a first power line including a series connection of said fluid torque converter, said first on-off clutch, and said first gear train when said first synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input member to said output shaft in a normal rotational direction; a second synchronizer which connects said input member and said output shaft via a second power line including a series connection of said second on-off clutch, said first one way clutch, and said second gear train when said second synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input member to said output shaft in a normal rotational direction and which connects said input member and said output shaft via a fourth power line including a series connection of said second on-off clutch, said first one way clutch, and said fourth gear train when said second synchronizer is shifted to a second side of said neutral position so as to transmit rotational power from said input member to said output shaft in said normal rotational direction; and a third synchronizer which connects said input member and said output shaft via a third power line including a series connection of said third on-off clutch, said second one way clutch, and said third gear train when said third synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input member to said output shaft in said normal rotational direction and which connects said input member and said output shaft via a fifth power line including a series connection of said third on-off clutch, said second one way clutch, and said fifth gear train when said third synchronizer is shifted to a second side of said neutral position of said second synchronizer so as to transmit rotational power from said input member to said output shaft in said normal rotational direction.

4,548,102
HOLE FILLING SYSTEM FOR TIRES

Jobbie DiRocco, 3424 Sweetbriar Ave., Akron, Ohio 44321, and David J. DiRocco, 7090 Grove Rd., Clinton, Ohio 44216

Filed Dec. 27, 1983, Ser. No. 565,916
Int. Cl.[4] B60C *25/16*
U.S. Cl. 81—15.7 12 Claims

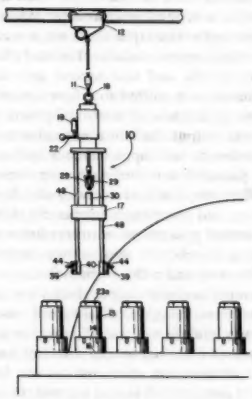


1. In a system for repairing a tire in which an elongated cylindrical insert of resilient material is positioned, under compression, in a hole extending from an inner surface to an outer surface of said tire, a tool tip containing a cylindrical compression chamber of lesser diameter than said insert, means for pushing said tool tip through said hole, means for pushing said insert into said compression chamber of said tool tip a sufficient distance so that a forward end of said insert extends beyond said end of said tool tip and beyond said outer surface of said tire, means for pulling said tool tip out of said hole leaving said insert in said hole and said insert having a cylindrical portion and a tapered portion located at said forward end for reducing the force necessary to push said insert into said compression chamber of said tool tip.

4,548,103
STUD DRIVE TOOL

Joseph N. Orban, 12 Greensview Dr., Scotch Plains, N.J.

Filed Apr. 1, 1981, Ser. No. 249,946
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—53.2 2 Claims



1. A stud drive tool comprising:

a base plate adapted to rest on a flange of a vessel receiving a stud;

means secured to the base plate to insert a stud into or remove the stud from an aperture in the flange including:

a stud driving mechanism for rotating the stud including a socket, driven by an air motor adapted to fit over the top of the socket;

piston controlled means to support and equalize the weight of the stud during inserting into and removal from the flange, including:

a jaw clamp insertable into a threaded hole in the top of said stud, to support and equalize the weight of the stud, the jaw clamp is threaded to engage internal threads in the cavity of the stud; and

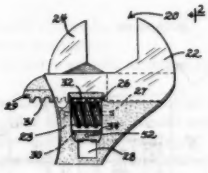
wherein the jaws of the clamp are resiliently coupled and inserted closed into the stud cavity and opened in the cavity to lift the stud and compensate for the weight of the stud; and

means to absorb counter-torque produced as the stud is inserted into or removed from the flange, said counter-torque absorbing means including a reaction rod adapted to rest against the flange during insertion into or removal of the stud from the flange of the vessel.

4,548,104
ADJUSTABLE SELF LOCKING CROW FOOT WRENCH

Perry L. Hendricks, P.O. Box 4B, Farmersville, Ill. 62533

Filed Aug. 7, 1984, Ser. No. 638,573
Int. Cl.[4] B25B *13/16*
U.S. Cl. 81—165 9 Claims



1. An adjustable, self-locking crow foot wrench comprising:

a support member;

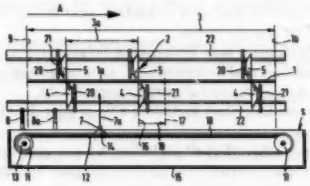
the support member having a pair of jaws mounted for relative movement to fit bolts of different sizes, a manually movable adjustment member, means to adjust the spacing between the jaws in response to movement of the adjustment member, and a drive-stud-receiving recess; and

means responsive to insertion of a drive stud into the recess to lock the adjustment member against movement and thereby fix the spacing between the jaws to fit a selected size bolt.

4,548,105
METHOD AND ARRANGEMENT FOR OBSERVING A POSITION

Pauli Koutonen, Järvenpää , Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Filed Feb. 16, 1984, Ser. No. 580,669
Claims priority, application Finland, Mar. 1, 1983, 830673
Int. Cl.[4] B26D *1/24*
U.S. Cl. 83—13 12 Claims



1. A method of precisely determining the position along a path of movement of a member that is movable along said path of movement relative to a datum position, comprising:

(a) moving a measuring device independently of the movable member in one direction parallel to said path of movement to a first observation position, corresponding to the position of the movable member;

(b) indicating the distance between the first observation position and said datum position;

(c) if the distance indicated in step (b) is not substantially equal to the desired distance beween the movable member and the datum position, shifting the movable member from its position corresponding to the first observation position to an altered position, the shift being by such a distance and in such direction that the distance between the altered position and the datum position is substantially equal to said desired distance, whereas if the distance indicated in step (b) is substantially equal to the desired distance, maintaining the movable member stationary;

(d) moving the measuring device in said one direction to a position beyond the first observation position and said movable member;

(e) moving the measuring device in the direction opposite to said one direction to an observation position corresponding to the position of the movable member after step (c); and

(f) indicating the distance between the observation position of step (e) and said datum position.

4,548,106

PROCESS AND APPARATUS FOR CONTINUOUS CUTTING OF STRIP- OR ROPE-LIKE MATERIAL

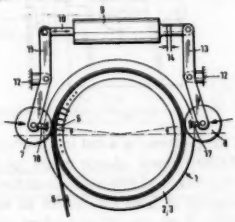
Heinz Fleissner, Riehen, Switzerland, assignor to Fleissner GmbH & Co., Engelsbach/Ffm., Switzerland

Filed Mar. 26, 1984, Ser. No. 593,263

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311190

Int. Cl.[4] D01G *1/04*

U.S. Cl. 83—18 **15 Claims**



1. A process for cutting strip- or rope-like textile material, especially for the production of staple fibers from synthetic fiber tows, which comprises feeding the textile material to be cut to a rotating cutting wheel to form a wound package thereon, said cutting wheel having a plurality of cutting knives pointing in the radial direction, cutting the textile material by at least two forces acting in the radial direction between the textile material and the cutting wheel, the wound package with radially superimposed winding laps being continuously formed from the textile material in such a way that the textile material, respectively, newly fed to the cutting wheel forms a winding layer of the wound package lying radially farthest away from the cutting blades, and that continuously the winding layer laying radially intermost on the inside is cut through by the cutting blades of the cutting knives, said at least two forces producing cutting pressure on the wound package from the outside of the cutting wheel against the wound material and including two forces that are, respectively, acting in a direction in opposition to each other.

4,548,107

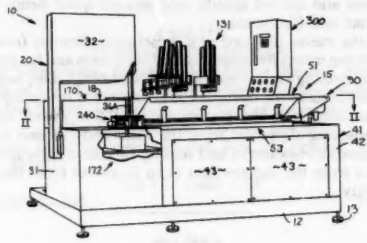
MEAT SLICING MACHINE AND METHOD

Gerald R. Marchese, Elmhurst, Ill., and Richard B. Calhan, Warsaw, Ind., assignors to Auto-Indexer, Elmhurst, Ill.

Filed Sep. 14, 1983, Ser. No. 532,241

Int. Cl.[4] B26D *7/30, 7/01*

U.S. Cl. 83—23 **20 Claims**



1. A method for cutting slices from a sliceable product, comprising:

presetting a desired reference weight for a slice of said sliceable product;

advancing said sliceable product against an opposed adjustable backstop;

cutting said sliceable product in a plane spaced from said adjustable backstop to remove a slice therefrom; and

adjusting the position of said backstop with respect to said cutting plane in a direction to tend to reduce a weight difference between the last cut slice weight and said preset reference weight in cutting the next slice from the sliceable product, said adjusting step including detecting the weight of the last cut slice, comparing said slice weight and reference weight and providing a difference output representing a difference therebetween, positioning said backstop by motor means, actuating said motor means in one direction to advance said backstop toward said cutting plane in response to a said difference output wherein said slice weight exceeds said reference weight, and actuating said motor means in the opposite direction to retract said backstop away from said cutting plane in response to a said difference output wherein said slice weight is less than said reference weight.

4,548,108

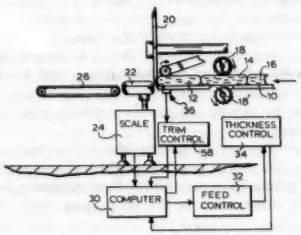
SLICING MACHINE

Edmund G. Dennis, Belle Terre, N.Y., assignor to Cashin Systems Corporation, Hauppauge, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,312

Int. Cl.[4] B26D *5/32*

U.S. Cl. 83—27 **11 Claims**



1. A slicing machine for slicing bacon bellies continuously, each belly having a front end portion, a rear end portion and main body therebetween, said end portions having an end

portion cross-sectional area, said end cross-sectional area being smaller than the cross-sectional area of the main body, said machine comprising:

a platform;

a slicing means positioned adjacent to said platform;

feed means for advancing bellies disposed on said platform toward said slicing means for slicing;

means for removing slices cut off by said slicing means at first and second speeds, said second speed being lower than said first speed;

sensing means disposed at a preselected distance from said slicing means for detecting said belly ends and for generating sensing signals indicative of said belly ends; and

control means for operating said means for removing slices cut from said end portions at said first speed, and for removing slices cut from the main body at said second speed in response to said sensing signals to separate slices cut from the end portions from slices cut from the main body.

4,548,109

APPARATUS FOR POSITIONING TOOLS

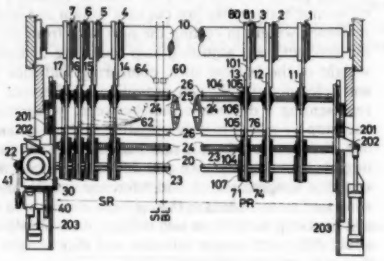
Masateru Tokuno, Hyogo; Tetsuya Sawata, Kyoto, and Yasuharu Mori, Hyogo, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Division of Ser. No. 318,042, Nov. 4, 1981,. This application Jun. 22, 1983, Ser. No. 506,849

Claims priority, application Japan, Nov. 13, 1980, 55-160317; Feb. 24, 1981, 56-27377; Sep. 1, 1981, 56-138095

Int. Cl.[4] B26D *1/24*

U.S. Cl. 83—71 **2 Claims**



1. An apparatus for positioning tools wherein a plurality of tools or pairs of tools mounted on a carrier shaft or a pair of carrier shafts are moved and positioned along said carrier shaft or pair of carrier shafts by means of a plurality of shifters which correspond in number to the number of said tools or pairs of tools, said shifters being mounted on a rotatable shaft and controlled by a control system so as to be moved or not to be moved along said rotatable shaft in accordance with the rotation of said rotatable shaft, characterised in that said apparatus comprises.

(a) a stand-by reach for storing the tools,

(b) a positioning reach in which the tools are selectively and operatively postioned by the shifters, said stand-by and positioning reaches being arranged side-by-side whereby tools can be moved selectively between said reaches by the shifters,

(c) an origin disposed between said stand-by and positioning reaches, said origin providing a borderline between said reaches where tools may be retained stationary temporarily while other tools in the postioning reach are being moved,

(d) a signal generator disposed at a fixed location spaced from the shifters, said signal generator being rotatable synchronously with the rotation of said rotatable shaft to measure movement of the shifters when said shifters are located in the positioning reach,

(e) a first detector located at the origin for the purpose of indicating the origin,

(f) a second detector located at a stand-by position in said stand-by reach and

(g) detector means mounted on each shifter for cooperation with the detectors located at the origin and at the stand-by position to enable detection of a shifter when located at said origin or at said stand-by position.

4,548,110

CUTTING DEVICE FOR A FLEXIBLE WEB

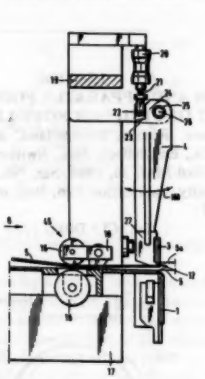
Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Switzerland

Continuation-in-part of Ser. No. 529,310, Sep. 6, 1983, abandoned. This application Mar. 5, 1985, Ser. No. 708,307

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233097

Int. Cl.[4] B26D *3/16*

U.S. Cl. 83—176 **8 Claims**



1. Apparatus for positioning a cut in a web of flexible material, said web having a pair of side edges joined together to from a tube having a central axis and at least one diameter, said web further defining at least one series of spaced incisions extending inwardly from one of said edges across said web, said apparatus comprising:

a frame;

means for moving said web along a path in the direction of said axis;

means mounted to said frame and positioned along said path for compressing said tube to less than said diameter as said web moves therepast and subsequently releasing said web;

an arm pivotally mounted to a first point to said frame for arcuate movement along a pivot path having one tangent thereto which is parallel to said central axis of said tube;

means for pivotally moving said arm about said pivot point;

said arm defining a flat surface disposed perpendicularly to said pivot path;

cutting means carried on said arm for cutting said web;

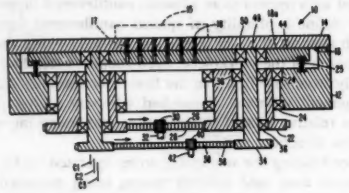
means for pivotally moving said arm away from said web in direction reverse to the direction of movement of said web, moving said arm in the direction of movement of said web until said surface contacts a stop defined by a released portion of said web at one of said incisions; and

means for operating said cutting means.

4,548,111
SPIRAL ORBITAL SHEAR APPARATUS

Robert R. Tarbuck, Ardmore, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 2, 1984, Ser. No. 636,935
Int. Cl.[4] B21F 11/00
U.S. Cl. 83—196 12 Claims

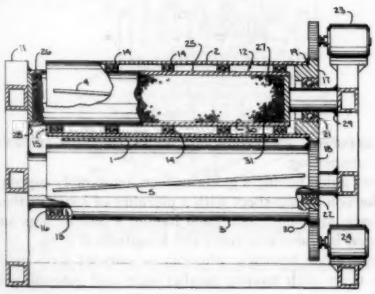


1. A spiral orbital shear apparatus comprising:
a first fixed plate having a planar surface and including an array of apertures formed therethrough;
a second plate including said array of apertures, said second plate having a planar surface abutting said first plate planar surface;
a first eccentric drive member;
first means connected for rotating said first eccentric drive member at a first rate in a first direction;
a second eccentric drive member connected to said second plate and connected to rotate with said first eccentric drive member; and
second means connected for rotating said second eccentric drive member at a second rate in said first direction independently of said first means for rotating.

4,548,112
WEB CUTTING

Richard H. Thomas, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed Jul. 20, 1984, Ser. No. 632,941
Int. Cl.[4] B26D 1/62
U.S. Cl. 83—345 7 Claims

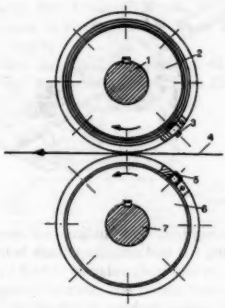


1. A device for cutting a plurality of individual sheets in succession from a longitudinally traveling continous web of material, comprising:
(a) a frame,
(b) a pair of elongated tubular cutting cylinders having engageable knives on the walls thereof for cutting the web,
(c) support shafts disposed concentrically within said cutting cylinders and fixedly connected to said frame,
(d) support means disposed internally of said cutting cylinders and mechanically connecting said cylinders and said shafts,
(e) said means to rotatably drive said cutting cylinders at a rotative speed providing a given cutting frequency, thereby producing vibrations at the moment of each cut by said knives which are transmitted to said shafts,
(f) each said support shaft comprising an imperforate thin-walled closed-ended cylinder, forming an enlarged closed cavity extending from end-to-end therein so that the resonant frequency of each assembly of shaft and cutting cylinder is maximized relative to said cutting frequency.

4,548,113
PERFORATING DEVICE

Bernd Töpperwien, Rossdorf, and Lothar Krause, Riedstadt, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,562
Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319512
Int. Cl.[4] B26F 1/08
U.S. Cl. 83—345 7 Claims



1. A device for perforating a web or sheet of material, comprising a rotatable male die carrier roll having at least one radially extending cylindrical bore opening into the outer periphery thereof, a male die holder comprising a hollow cylinder having an outer diameter substantially equal to the diameter of said bore and being removably located within said bore, said outer diameter and the inner diameter of said cylinder being defined by substantially smooth inner and outer cylindrical surfaces, and said cylinder having a through slit extending in a radial direction completely between said surfaces and completely between opposite ends of said cylinder, and means for applying an external force against said cylinder for frictionally holding a male die member in place therewithin, said slit permitting said cylinder to yield to said force applying means.

4,548,114
TOOL FOR NOTCHING AND SLITTING TUBING

Craig A. Sauer, R.R. 2 Box 213, Wilton, Iowa 52278

Filed Sep. 4, 1984, Ser. No. 646,923
Int. Cl.[4] B26D 3/14, 3/16, 9/00
U.S. Cl. 83—391 5 Claims

1. A tool for slitting and notching plastic tubing comprising:
an elongated body having a longitudinal bore therethrough and fastening means for rigid stationary support thereof, said bore having an inside dimension slightly more than the outside dimension of said tubing, said body having a beginning end in which a piece of said tubing is inserted into said bore and a finishing end from which said piece of said tubing is removed,
a slitting blade secured to said body at a position intermediate said ends thereof to extend on a longitudinal plane into said bore, a sharp cutting edge of said blade being directed toward said beginning end,
a stop connected to said body at a position between said slitting blade and said finishing end of said body, said stop

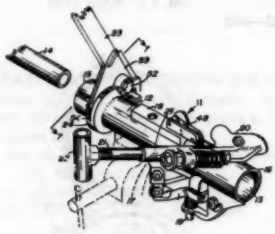
being movable between a first position within the bounds of said bore and a second position outside a line of movement of said piece of tubing through said bore,

means for moving said stop between said first and second positions thereof, said stop initially being in said first position,

said slitting blade being positioned to cut a longitudinal slit on said longitudinal plane in an end of said piece of tubing as said end of said piece is pushed within said bore from the beginning end of said body until said end of said piece contacts said stop,

a notching blade, said body having an opening to permit said notching blade to be pulled toward said beginning end on a slanting line at an acute angle with respect to said longitudinal slit,

guiding and operating means connected between said body and said notching blade for pulling said notching blade



along said slanting line, said guiding and operating means and said opening for said notching blade being positioned longitudinally on said body relative to said stop and therefore relative to said end of said piece of tubing against said stop such that said notching blade upon being pulled contacts first said end of said piece of tubing at a point within a central portion of a quadrant adjacent said longitudinal slit and cuts from said point a slanting slit on said slanting line toward said longitudinal slit, said guiding and operating means being restrained in distance of movement to stop movement of said notching blade shortly after said slanting slit reaches said longitudinal slit and therefore when an acutely pointed cutout is cut from said end of said piece of said tubing, and

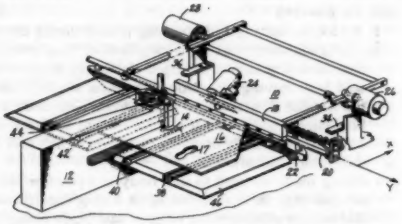
means for moving said stop to said second position thereof for permitting passage of said piece of tubing through said bore for completing said longitudinal slit along the full length of said piece of said tubing.

4,548,115

POSITIONING APPARATUS

John F. Martin, Essex, and Donald E. Ripley, Peabody, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Apr. 28, 1983, Ser. No. 487,231
Int. Cl.[4] B26D *7/02*
U.S. Cl. 83—409 **10 Claims**



1. In a machine having an operative tool which performs one or more operations on a workpiece positioned on a planar bed underneath the operative tool, a positioning apparatus for positioning the workpiece on the planar bed said positioning apparatus comprising:

a movable frame mounted for movement in a first direction relative to the planar bed, said frame having a plurality of cantilevered supports, each cantilevered support being spaced with respect to an adjacent cantilevered support so as to define a plurality of spaced cantilevered supports which support the workpiece substantially along the entire length of the workpiece, each support extending outwardly from said frame in the first direction into slidable engagement with the planar bed whereby each support moves relative to said planar bed as said frame moves in the first direction; and

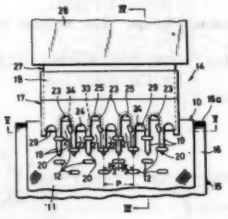
means for holding the workpiece to be operated on by said operative tool, said holding means being mounted for movement on said frame in a second direction which is transverse to the first direction of movement, whereby the workpiece is moved in the second direction relative to said plurality of cantilevered supports and said planar bed as it is being supported on said plurality of cantilevered supports during movement in the first direction.

4,548,116

APPARATUS FOR PRODUCING HOOKS ON LOOP-AND-HOOK FASTENERS

Hiroshi Yoshida, Kurobe, and Ryuichi Murasaki, Tateyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 12, 1983, Ser. No. 513,014
Claims priority, application Japan, Jul. 13, 1982, 57-121433
Int. Cl.[4] D06C *13/08*
U.S. Cl. 83—444 **4 Claims**



1. An apparatus for producing hooks on hook-and-loop fasteners, comprising:

(a) a sheet guide having a guide surface for slidably supporting thereon a loop sheet with a plurality of loops of thermoplastic synthetic resin each having a pair of legs and arranged in transverse rows and longitudinal tiers;

(b) a loop guide having a plurality of parallel loop guide comb teeth each having parallel sides and extending in overhanging relation to said guide surface for guiding said loops in said tiers along said loop guide comb teeth;

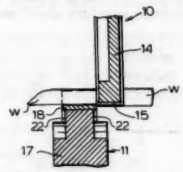
(c) an ultrasonically vibratable cutter spaced from said loop guide and having a plurality of aligned leading cutter edges extending perpendicularly across selected side edges of said loop guide comb teeth and spaced therefrom for cutting off a selected one of the legs of each loop under ultrasonic energy when the loops are guided along said loop guide comb teeth into contact with said cutter edges; and

said loop guide comb teeth being transversely spaced with spaces defined therebetween, said spaces being alternately longer and shorter in a longitudinal direction, each of said cutter edges respectively extending continually solely across only one of the shorter spaces.

4,548,117
NON-DULLING SLITTER

Kenneth G. Frye, South Egremont, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 25, 1983, Ser. No. 480,122
Int. Cl.⁴ B23D *19/04*; B26D *1/24*
U.S. Cl. 83—500 **6 Claims**



1. A circular rotary slitter, comprising:

a body hub formed from an easily machined material and having an annular axially centered radially outwardly projecting anchoring fin rib embedded in a buffer ring engaged about the body hub and providing a circular perimeter and axially oppositely facing surfaces extending to said perimeter;

a hoop shaped cylinder formed from thin tool steel and firmly mounted on said perimeter;

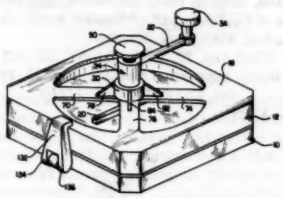
said cylinder having opposite margins projecting axially in overhanging relation to said surfaces and providing cutting edges which are substantially axially offset from the adjacent axially facing surfaces; and

said buffer ring being a shock and vibration absorbing member between said body hub and said cylinder.

4,548,118
ROTARY CUTTER

Fred C. Brosch, Cleveland, Ohio, assignor to Brosch Products, Inc., Cleveland, Ohio

Filed Oct. 31, 1983, Ser. No. 547,058
Int. Cl.⁴ B26D *3/00*
U.S. Cl. 83—522 **17 Claims**



1. A rotary cutter for cutting apertures in sheet material, comprising:

a base having a flat upper surface for supporting sheet material to be cut;

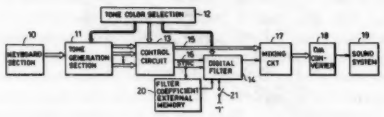
a cover pivotally mounted to said base for movement between a lowered closed position where it overlies said upper surface of said base and a raised open position;

rotary cutter means mounted on said cover and including a rotor shaft, a blade arm carried by said shaft extending radially outward therefrom, a cutting blade mounted on said arm for cutting holes in said sheet material when said cover is in is closed position and said shaft is rotated, and drive means for imparting rotational movement to said shaft, said cover having means for rotatably supporting said shaft intermediate its ends in such a manner as to permit rotary movement of the shaft about its axis of rotation as well as axial movement so that as the shaft is rotated an axial force may be imparted thereto to press said cutting blade downwardly against said sheet material during cutting operations and for permitting said blade to be removed from and be free of said sheet material; said cover has raised side walls extending away from said base and has a roof interconnecting said side walls so as to define a cavity between said cover and said base for receiving said sheet material therein, said blade arm is adjustably mounted to said shaft within said cavity such that the cutting radius may be adjusted, said roof of said cover has a plurality of measurement scales located on its interior surface for use in adjusting the radial positioning of said blade relative to said shaft making different sized cuts in said sheet material, said roof has openings defined therein and each of said scales extends radially outward from said shaft intermediate a pair of said openings whereby said openings permit observation of the cutting operation by the operator.

4,548,119
DIGITAL FILTER FOR AN ELECTRONIC MUSICAL INSTRUMENT

Masatada Wachi, and Mitsumi Katoh, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 21, 1982, Ser. No. 451,880
Claims priority, application Japan, Dec. 25, 1981, 56-209109
Int. Cl.⁴ G10H *1/02*
U.S. Cl. 84—1.19 **18 Claims**



1. A digital filter system in an electronic musical instrument comprising:

tone signal supply means for timewisely serially supplying digital tone signals consisting of successive musical tone sample point amplitudes each represented by a plural bit digital value, each such value being delivered bit serially on a single line;

filter coefficient supply means for timewisely bit serially supplying plural bit filter coefficients which establish a tone color; and

calculation means for implementing a predetermined filter operation by performing mathematical operations in bit-serial fashion on said bit serially delivered sample point amplitudes supplied by said tone signal supply means and the bit serially supplied filter coefficients from said filter coefficient supply means to produce bit serially outputted tone signals which are filter-controlled in response to said filter coefficients.

4,548,120
EXTERNALLY POWERED SEPARATE LOADED AMMUNITION CANNON

Richard Ciekurs, New Providence, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,350
Int. Cl.⁴ F41F *9/10*
U.S. Cl. 89—11 **3 Claims**

1. An externally powered automatic cannon comprising:

a receiver;

a barrel connected to said receiver and having a bore with a rear end opening toward said receiver for receiving a projectile;

a chamber member having a chamber for receiving a propellant case and movable in said receiver from an operating position with said chamber aligned and communicating with said rear end opening of said barrel, to a loading

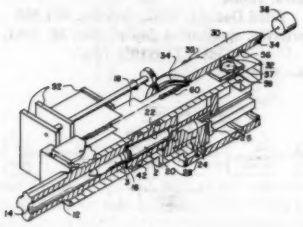
position with said chamber misaligned with and spaced from said rear end opening;

projectile feed means for feeding a plurality of projectiles, one at a time, into alignment with said rear end opening;

projectile ram means for ramming a projectile which is in alignment with said rear end opening, into said rear end opening in a first direction;

case feed means for feeding a plurality of propellant cases, one at a time, into alignment with said chamber when said chamber member is in said loading position; case ram means for ramming a propellant case which is in alignment with said chamber, into said chamber in a second direction opposite to said first direction, when said chamber is in said loading position; and

external drive means cyclically movable on said receiver and operatively engaged with said chamber member, said projectile ram means and said case ram means for moving said chamber member into said loading position, ramming a projectile and a case and returning said chamber member into said operating position during one cycle, said external drive means comprising a main cam drum rotatably



mounted around said receiver and having a main cam groove therein, and a cam follower engaged with said chamber member having a portion projecting into said main cam groove for moving said chamber member between said operating and loading positions, said receiver further including at least one additional cam groove extending at least partially along a longitudinal axis of said cannon and at least partially at an angle to said longitudinal axis, said chamber member having a projection extending into said additional cam groove for moving said chamber member from said operating position to said loading position; and

a bolt/ejector assembly slidably mounted to said chamber member having an end at a base of said member, and a stop formed in said receiver against which said bolt/ejector assembly engages as said chamber member moves past said loading position from said operating position through the movement of said main cam drum for displacing said bolt/ejector member with respect to said chamber member to dislodge and eject a spent propellant case from said chamber.

4,548,121

BREECH MECHANISM WITH A MUSHROOM HEAD PACKING

Karl-Egon Janssen, Meerbusch, and Heinz G. Breür, Duisburg, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 560,801

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247744

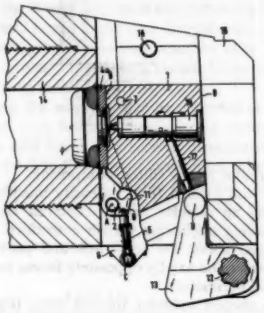
Int. Cl.⁴ F41F *11/02*

U.S. Cl. 89—26 **5 Claims**

1. An improved breech mechanism for a gun barrel, having a breech aperture defined by a bottom member and a breech block which is operatively movable transversely with respect to the gun barrel axis, and and obturator which is controlled by the movement of the breech block, the improvement comprising,

said obturator being pivotally mounted about a first axis which is normal to the longitudinal axis of the gun barrel and is pivotable over an angle of 90° to move from a closed firing position to an open loading position and vice-versa;

a pair **16** control cams being pivotally mounted at opposite sides of the breech aperture about second and third axes



which are normal to the longitudinal axis of the gun barrel;

said breech block having a pair of laterally projecting first pins which are adapted to slidingly guide the pair of control cams during their pivotal movement;

a pair of biasing members being respectively pivotally connected at one of their ends to opposite walls of said breech aperture and at their other ends to said control cams so as to bis said obturator either into said closed firing position or said open leading position.

4,548,122

MORTAR CARRIAGE

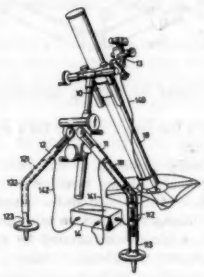
Börje Hansson, Märsta; Börje Johansson, and Torbjörn Pramskog, both of Eskilstuna, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Aug. 22, 1983, Ser. No. 525,242

Claims priority, application Sweden, Aug. 25, 1982, 8204876

Int. Cl.⁴ F41F *1/06, 21/10*

U.S. Cl. 89—37.05 **4 Claims**



1. Apparatus for automatic restoration of the elevation and the azimuth of a mortar tube which is equipped with a support including a holder for the mortar tube and two supporting angularly related legs which are each equipped with an electric motor adjustment device for individual adjustment of their lengths, the apparatus comprising:

a sensor means for detecting changes in the elevation and the

azimuth of said mortar tube and for generating respective signals;

a control device coupled to said sensor means and receiving said respective signals, said control device independently controlling each electric motor in said legs, said control device including:

first means for adjusting the lengths of said legs in the same direction by actuation of both motors in said legs dependent upon the signals representative of changes of the elevation; and

second means for adjusting the lengths of said legs in respective opposite directions by actuation of corresponding motors in respective legs dependent upon the signals representative of changes of the azimuth.

4,548,123

OSCILLATOR

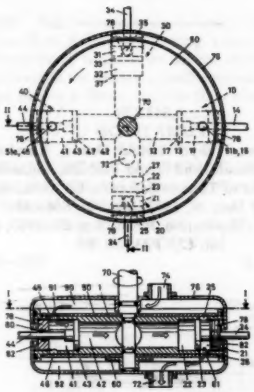
Mario Schelling, Weidstrasse 629, 8913 Ottenbach; Bruno Schelling, and Armin Schelling, both of Stationsstrasse 7, 8907 Wettswil, all of Switzerland

Filed Jan. 29, 1982, Ser. No. 344,055

Claims priority, application Switzerland, Feb. 6, 1981, 815/81

Int. Cl.⁴ F15B *21/02*

U.S. Cl. 91—39 **7 Claims**



1. A high frequency oscillator having a housing, work pistons displaceably guided within positive-displacement chambers disposed within said housing, and having a pressurized fluid for a working medium, characterized in that the positive-displacement work chambers comprise two pairs of cylinders, each cylinder being divided by a respective one of said work pistons into an outer and an inner chamber, said two pairs of cylinders being disposed in the shape of a cross with the cylinder axes of said four cylinders being located in a common plane, the work pistons of opposing cylinders communicating in a force-transmitting manner via the inner chambers, each of the outer chambers having an axial passageway for a sealingly guided piston rod and openings for the passage therethrough of the fluid, and rotating control means for alternately and periodically supplying said fluid to one pair of the cylinders and removing it from the other pair of said cylinders,

said cylindrical walls of said outer chambers defining two spaced planes parallel to the common plane of the cylinder axes, the openings for fluid supply being disposed in one of said two planes and the openings for fluid removal being disposed in the other of said two planes,

and said control means comprising two rotatable discs rigidly connected with one another, each one of said discs being disposed in a sealed manner in a respective one of each of the said two planes, said discs being provided with holes which can be aligned with said openings,

whereby the frequency of movement of said pistons within said cylinders is controlled solely in response to the rotational speed of said control means.

4,548,124

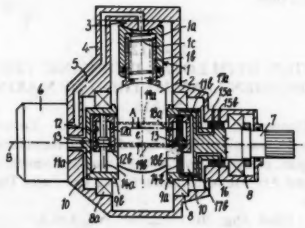
RADIAL PISTON HYDRAULIC MOTOR WITH VARIABLE ECCENTRICITY

Aurelio Ortelli, Bologna, Italy, assignor to Riva Calzoni S.p.A., Bologna, Italy

Filed Feb. 21, 1984, Ser. No. 581,624

Int. Cl.⁴ F01B *3/00*; F04B *1/26*

U.S. Cl. 92—12.1 **4 Claims**



1. A hydraulic motor of the type comprising a case, a plurality of cylinder-piston units lodged in said case and radially arranged about an eccentric, said eccentric being coupled for rotation with a rotating shaft, the motor further comprising drum-like formations rotatably supported on both sides of said eccentric and coaxially with said shaft, one of said formations being rigidly connected to said shaft, a guiding seat of prismatic shape formed diametrically in each of said drum formations, a pair of shoe members projecting from the opposite sides of said eccentric and engaging said guiding seats so as to permit radial displacement of said eccentric relative to said shaft in a direction transverse thereto and to maintain said eccentric and said shaft in common rotatory relationship, cylinder-piston devices being further provided arranged in said shoe members and acting on said drum-like formations to thereby displace said eccentric in said transverse direction.

4,548,125

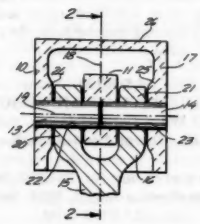
PISTON ARRANGEMENT, PARTICULARLY FOR AN INTERNAL COMBUSTION ENGINE

Werner Hüther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen Union GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,058

Int. Cl.⁴ F16J *1/14*

U.S. Cl. 92—187 **6 Claims**



1. A piston arrangement for an internal combustion engine, comprising:

a hollow piston having a circumferential wall,

support means at opposite sides of the piston wall for supporting an end of a piston pin,

an intermediate abutment within the piston, the piston and the intermediate abutment being formed as a single piece of ceramic material,

an opening extending completely through the intermediate abutment, the opening being spaced from each of the support means and being aligned with both support means,

two axially aligned piston pins made of ceramic material, each pin having one end supported within one of the support means and the other end supported within the opening in the intermediate abutment adjacent to the centerline of the piston, and

a piston rod having an end formed with means for engaging the two pins.

4,548,126

PISTON WITH LOCAL INORGANIC FIBER REINFORCEMENT AND METHOD OF MAKING THE SAME

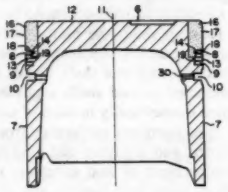
Tadashi Donomoto; Mototsugu Koyama; Yoshio Fuwa; Nobuhiro Miura, all of Toyota, and Tatsuo Sakakibara, Ueda, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Art Metal Manufacturing Co. Ltd., Tokyo, both of, Japan

Filed Aug. 20, 1982, Ser. No. 410,026

Claims priority, application Japan, Nov. 30, 1981, 56-191918

Int. Cl.⁴ F16J *1/01*

U.S. Cl. 92—213 **12 Claims**



1. An engine piston formed with a top crown surface, a top ring groove defined by an upper annular wall surface, a lower annular wall surface, and an annular bottom surface, and an upper annular land surface defined between said top ring groove and an annular edge of said top crown surface, said upper annular land surface and at least said upper and lower annular wall surfaces of said top ring groove being defined by a part of said piston formed of a matrix metal reinforced with inorganic fibers, the proportion of said inorganic fibers by volume in said fiber-reinforced part of said piston being substantially between two percent and ten percent, at least ninety percent of said inorganic fibers having fiber diameters between one micron and twenty microns, and at least ninety percent of said inorganic fibers having fiber lengths less than twenty millimeters, the surface parallel orientation ratio of said inorganic fibers making up at least said upper and lower annular wall surfaces of said top ring groove being fifty percent or less.

4,548,127

PISTON FOR INTERNAL COMBUSTION ENGINE

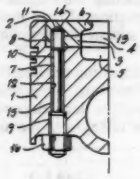
Stephen J. Dunn, 22 Wood Gate, Helpston, and Alan W. Sparrow, 18 Amanda Ct., Thorpe Lea Rd., both of Peterborough, England

Continuation-in-part of Ser. No. 261,222, May 8, 1981, abandoned. This application Aug. 3, 1983, Ser. No. 520,030

Int. Cl.⁴ F16J *1/04*

U.S. Cl. 92—220 **10 Claims**

1. A piston for an internal combustion engine comprising a piston body and a crown portion connected by anchoring means that transmits tensile and compressive loads from the crown to a portion of the piston body; the anchoring means comprising a number of elongate members each extending through a bore in the piston body, first connection means rigidly axially connecting one end of each elongate member to the crown portion, and second connection means rigidly axially connecting the other end of each elongate member to said portion of the piston body and comprising cooperating surfaces associated with said elongate member and said portion of



the piston body; and preloading means being provided that acts between said elongate member and piston body to produce strain energy that is stored in the anchoring means and piston body and acts axially to prevent parting of said cooperating surfaces of said second connection means.

4,548,128

FUME HOOD

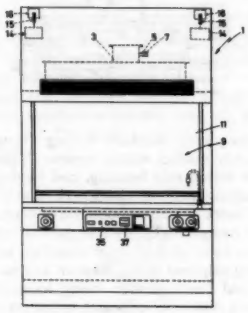
Tatsumi Morikawa, Tokyo; Yoshio Osawa, Kasukabe; Takao Kawakami, Kitamoto, and Naoki Yoshida, Sagamihara, all of Japan, assignors to Yamato Scientific Co., Ltd., Japan

Filed Dec. 28, 1983, Ser. No. 566,435

Claims priority, application Japan, Sep. 29, 1983, 58-179214

Int. Cl.⁴ F23J *11/00*

U.S. Cl. 98—115.3 **3 Claims**



1. A fume hood comprising:

a hood forming an experimental work space,

an exhaust duct for exhausting the air in the workspace,

a by-pass section provided on said exhaust duct, said by-pass section being in communication with the ambient air,

said by-pass section having a small diameter portion fitted at a right angle to said exhaust duct and a large diameter portion fitted to said small portion, and

an air velocity sensor provided in said large portion of said by-pass section,

whereby the ratio of said small diameter portion of said by-pass section to said large diameter portion of said by-pass section is such that the velocity of the air in said large diameter portion is suitable to detect the variation of the velocity of the air in said hood.

4,548,129

COFFEE MAKER

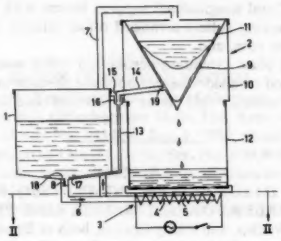
Willem L. N. van der Sluys; Jacobus Pastoor, and Johannes C. M. Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1984, Ser. No. 657,290

Claims priority, application Netherlands, Oct. 6, 1983, 8303421

Int. Cl.⁴ A47J *31/00*

U.S. Cl. 99—281 **7 Claims**



1. A coffee maker comprising a water reservoir, a filter device and a flow heater for heating water from the water reservoir for delivery to the filter device, characterized in that means are provided for adding a small amount of coffee extract to the water before it flows into the flow heater.

4,548,130

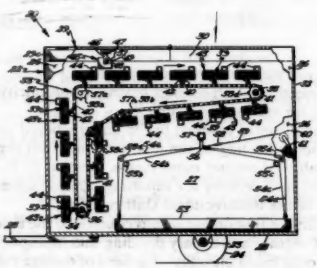
AUTOMATIC FOOD COOKING MACHINE

Lester Diener, Box 354, and Ernest J. Miller, R.R. 2 Box 2105, both of Spooner, Wis. 54801

Filed Feb. 29, 1984, Ser. No. 584,748

Int. Cl.⁴ A47J *37/04*

U.S. Cl. 99—345 **20 Claims**



1. Food cooking machine comprising, in combination: means for heating the food; a multiplicity of food baskets, with each food basket having a bottom, a first side, a second side, a third side, a fourth side, and a top defining a food receiving interior, with the food baskets formed of material allowing exposure to the heating means of the food located within the food receiving interior of the food baskets; means for transporting the food baskets to expose the food located in the food receiving interior of the food baskets to the heating means; with the transporting means comprising, in combination: retainers for removably receiving the food baskets, with each of the retainers including a top, a bottom, a first side, and a second side defining a retainer interior for removably receiving the food baskets, with each of the retainers further including a generally open end for the slidable receipt of the food baskets into the retainer interior, with the top, bottom, and sides of the retainer being generally closed for removal of the food baskets therethrough but which allow the food in the food receiving interior of the food baskets to be exposed to the heating means; and means for conveying the retainers and the food baskets located therein along a cooking cycle path.

4,548,131

MOBILE APPARATUS FOR THE INFIELD HANDLING OF FIBROUS MATERIAL

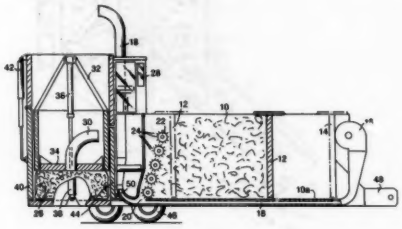
John L. Williams, 157 Hill St., Orange, New South Wales, Australia

Filed Aug. 24, 1983, Ser. No. 525,893

Claims priority, application Australia, Aug. 25, 1982, PF5559; Oct. 8, 1982, PF6261

Int. Cl.⁴ B30B *15/30;* **B65B** *13/20*

U.S. Cl. 100—1 **7 Claims**



1. A vehicle for the in-field processing of cotton which is in a form as picked by a mechanical cotton picker, said vehicle comprising:

a storage bin for the cotton, said storage bin having a floor,

a plurality of beaters generally positioned above the floor of said storage bin for converting the cotton therein into loose, substantially homogeneous cotton pieces, said beaters being located generally vertically above one another,

movable means within said storage bin for moving the cotton therein toward said plurality of beaters,

a cotton compacting means,

means associated with said cotton compacting means for storing strapping which can be used to secure the loose, substantially homogeneous cotton pieces after being compacted in said cotton compacting means,

a duct means for conveying the loose, substantially homogeneous cotton pieces falling to the floor of said storage bin to said cotton compacting means, and

an air blower associated with said duct means for generating an air stream within said duct means that flows from said storage bin to said cotton compacting means, said air stream entraining the loose, substantially homogeneous cotton pieces entering therein.

4,548,132

REFUSE COMPACTOR

Jerry W. Moon, 1450 Kempster Rd., Lake Orion, Mich. 48035

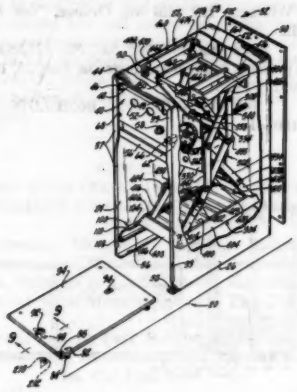
Continuation-in-part of Ser. No. 276,479, Jun. 23, 1981, abandoned. This application Jun. 23, 1983, Ser. No. 507,171

Int. Cl.⁴ B30B *15/14, 15/06*

U.S. Cl. 100—52 **51 Claims**

1. In a refuse compactor of the type having a rectangular box-like cabinet made up of a pair of parallel upright side walls, a horizontal top wall connected to the side walls, a removable upright rear wall connected to the rear edges of the top and side walls and a horizontal bottom wall connected to and extending between the bottom edges of said side walls, a unitary trash basket and drawer having upright side walls, a rear wall, a hinged front door and a bottom wall, said drawer being removably received via an access opening in the front of the cabinet and horizontally movable between a fully inserted trash compacting position within the cabinet wherein said drawer bottom wall seats on said cabinet bottom wall and

movable outwardly therefrom to trash loading and unloading positions, and a refuse compacting mechanism mounted in the upper interior region of the cabinet and having a platen movable between a retracted position above the drawer and extended position disposed within the drawer when the latter is



in its compacting position, said side walls each being provided with an inturned flange along the lower horizontel edge thereof, and said cabinet bottom wall comprises a single sheet of relatively heavy thickness steel securely fastened onto said side wall flanges.

4,548,133

DEVICE FOR APPLICATION OF SURFACE PRESSURE IN DUAL BELT PRESSES

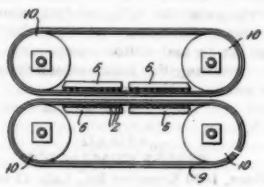
Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Continuation of Ser. No. 386,112, Jun. 7, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 637,322

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123291

Int. Cl.[4] B30B 5/06

U.S. Cl. 100—153 **6 Claims**



1. A dual band press assembly comprising:

an upper and a lower press band unit each comprising a pair of rotative guide cylinders and an endless press band arranged in driven engagement about each of said pair of guide cylinders, said press band units being arranged one above the other with said endless press bands having inner surfaces engaged about said guide cylinders and outer surfaces arranged to move in pressing engagement with each other, said outer surfaces of said press bands being particularly adapted to apply surface pressure to workpieces passing therebetween; and

roller assembly means provided in each of said upper and lower press band units for applying surface pressure to said endless press bands against said inner surfaces thereof, said roller assembly means comprising

a plurality of longitudinal support beams arranged adjacent and parallel to each other,

a plurality of spindles mounted to extend continuously between said support beams,

pressure rollers arranged to be in direct contact with said inner surfaces of said endless press bands on one side of said roller assembly means,

said spindles having said rollers rotatively mounted thereon and defining generally parallel axes of rotation for said rollers,

said rollers being mounted in rows extending between each pair of said longitudinal support beams with each of said rows having rollers arranged offset relative to each next adjacent row, and

a support plate extending across said roller assembly means provided on a side thereof opposite the side on which said rollers contact said inner surfaces of said endless press bands.

4,548,134

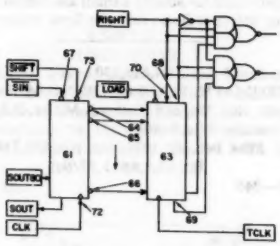
DOT IMAGE BUFFER AND DOT SEQUENCE SCRAMBLER FOR DOT MATRIX LINE PRINTER

Donald K. Wadley, and Philip Gordon, both of Boise, Id., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Feb. 15, 1984, Ser. No. 580,392

Int. Cl.[4] B41J 3/12

U.S. Cl. 101—93.04 **13 Claims**



1. An electronic network comprising:

a unidirectional shift register having a multiplicity of storage cells for storing a multiplicity of data bits;

first input means coupled to the unidirectional shift register for serial loading of the unidirectional shift register;

a plurality of second input means coupled to the unidirectional shift register for inputting control signals for control of the unidirecitonal shift register;

a plurality of first output means coupled to the unidirectional shift register and evenly dividing said multiplicity of storage cells into a plurality of groups of storage cells, each of said first output means providing serial output of the storage cells contained within an associated group of said plurality of groups, the output of each group is parallel with the output of the remaining groups of said plurality of groups of storage cells;

a bidirectional shift register having a plurality of storage cells, the plurality of storage cells equal to the plurality of said first output means, said plurality of storage cells for storing a plurality of data bits;

a plurality of third input means, the plurality of third input means equal to the plurality of first output means, each of said plurality of third input means coupled to one of the plurality of storage cells comprising the bidirectional shift register and to one of the plurality of first output means, the plurality of third input means for providing parallel loading of the bidirectional shift register;

a plurality of fourth input means coupled to the bidirectional shift register for inputting a plurality of control signals to control the bidirectional shift register; and

a pair of second output means, each of said pair of second

output means coupled to opposite ends of the bidirectional shift register, for selective bidirectional, serial output of said bidirectional shift register.

4,548,135

FLOOR CONVEYOR SYSTEM

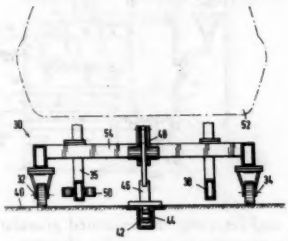
Werner Kupczyk, Frankfurt, Fed. Rep. of Germany, assignor to Fredenhagen KG, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 383,834, Jun. 1, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 659,860

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123638; Jun. 15, 1981, 3123706

Int. Cl.[4] B65G *37/00*; B61B *13/00*; B61J *1/10*

U.S. Cl. 104—135 **3 Claims**



1. A floor conveyance system for transporting goods along a preselected conveyance path, said system comprising in combination:

a drag chain conveyor defining a first surface;

a skid conveyor having one end adjacent said drag chain conveyor and defining a second surface disposed at a level higher than said first surface of said drag chain conveyor, said drag chain and skid conveyors together defining said conveyance path;

conveying frame means operatively engageable in said drag chain and said skid conveyors for supporting goods thereon and to convey said goods along said conveyance path, said frame means including a frame, front and rear pairs of wheels journally mounted to said frame to permit rolling movement across said first surface, said front and rear pairs of wheels being separated in the longitudinal direction by a predetermined dimension, and a pair of elongated parallel skid members fixedly mounted to said frame interiorly with respect to said front and rear pairs of wheels and each skid having a longitudinal length less than said predetermined dimension, said pair of skid members defining a contact surface at a level higher than the rolling contact of said front and rear pairs of wheels with said first surface, said contact surface establishing sliding contact with said second surface when said conveying frame is conveyed along said skid conveyor, and wherein, said front and rear pairs of wheels contact said first surface when said frame means is conveyed along said path by said drag conveyor while said pair of skid members are inoperative, and said front and rear pairs of wheels are disengaged from said rolling contact with said first surface when said pair of skid members come into engagement with said second surface of said skid conveyor.

4,548,136

TRACK-TRAVELING FOUR-WHEEL VEHICLE

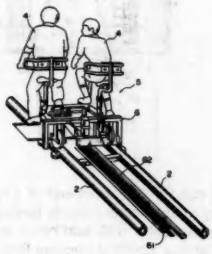
Kazuo Yamada, Kawasaki, Japan, assignor to Togo Japan Inc., Tokyo, Japan

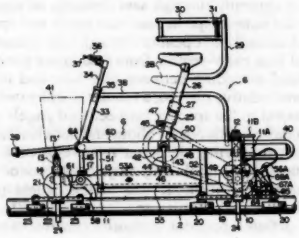
Filed Sep. 2, 1983, Ser. No. 529,140

Claims priority, application Japan, Sep. 16, 1982, 57-140451[U]; Sep. 16, 1982, 57-161445

Int. Cl.[4] A63G *7/00*; B61D *15/00*

U.S. Cl. 105—91 **6 Claims**





1. A track-traveling four-wheel vehicle for traveling by rolling along two rails such that a pair of drive wheels mounted on an axle of one of front and rear ends of a body are driven by manpower such as pedalling by a passenger or power such as a motor mounted in the body, roll together with a pair of driven wheels along the two rails, wherein said vehicle is comprised of: frames constituting said body of said vehicle and including an end frame located on the same side as that where the drive wheels are located; a vertical shaft mounted at a middle portion of the end frame; a swing frame having a proximal end portion which is pivotally mounted on said vertical shaft and distal end portion which is located below said body, said swing frame extending along a longitudinal direction of said body and being adapted to swing in a horizontal plane about said proximal portion thereof; a driven wheel support frame having a middle portion which is pivotally mounted on said distal end portion of said swing frame, said driven wheels being mounted at two ends of said driven wheel support frame; a support mechanism located on an upper surface of said distal end of said swing frame and which slidably supports another end frame of said frames which is located on the same side as that where said driven wheels lie, said another end frame being supported on the upper surface of said distal end portion of said swing frame; and a brake unit for braking said drive wheels upon operation of a brake lever by the passenger, said brake unit having a brake switching mechanism comprising an abutment member which nullifies the braking action upon abutting against a dog disposed between said rails at the beginning of a brake inhibiting interval of said track and restores the braking action upon abutting against another dog disposed at the end of the brake inhibiting interval.

4,548,137

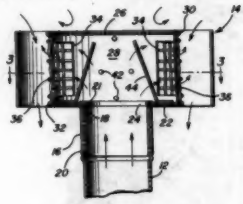
WIND CAP

Byron D. Lane, P.O. Box 257, Sawyer, N. Dak. 58781

Filed Mar. 5, 1985, Ser. No. 708,549

Int. Cl.⁴ F23L *17/12*

U.S. Cl. 110—184 **7 Claims**



1. A wind cap for the outlet end of a furnace flue pipe, said cap including a tubular inlet nipple having a first end for communicating connection with said outlet end and a second end, a base panel having a central opening formed therethrough and including two pairs of opposite outer marginal portions generally bisected by planes normal to said opening and each other and passing centrally through said opening, an upper panel of generally the same shape as said base panel and spaced thereabove, said second end opening through said opening from the side of said base panel remote from said upper panel, a tubular spacing panel extending between said base and upper panels and anchored relative thereto, a tubular shield panel of a length generally equal to the spacing between said panels and extending substantially continuously about and between said base and upper panels supporting the latter relative to each other, said tubular shield panel including major and minor transverse dimension defining portions, said tubular shield panel being telescoped over said tubular spacing panel with said minor dimension defining portions anchored relative to said tubular spacing panel and said major dimension defining portions spaced outward from diametrically opposite portions of said tubular spacing panel, said tubular spacing panel diametrically opposite portions having openings formed therein closed by screen panel portions, and a pair of inclined and upwardly convergent baffle panels interposed between said base and upper panels and having their lower marginal edge portions supported from said base panel and the upper marginal portions thereof terminating upwardly below said upper panel.

4,548,138

FAST FLUIDIZED BED REACTOR AND METHOD OF OPERATING THE REACTOR

Jakob Korenberg, York, Pa., assignor to York-Shipley, Inc., York, Pa.

Division of Ser. No. 331,767, Dec. 17, 1981, Pat. No. 4,469,050. This application May 24, 1984, Ser. No. 613,267

Int. Cl.⁴ F23G *7/00*

U.S. Cl. 110—245 **11 Claims**

1. A fluidized bed reactor, comprising:

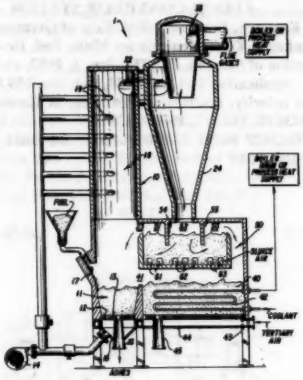
(a) a substantially upright fluidized bed reaction chamber for containing a bed of granular material, said chamber having an upper region and a lower region, said upper region having a cylindrically shaped interior surface;

(b) means for feeding matter to be reacted into said lower region of the reaction chamber;

(c) means for supplying a first stream of pressurized air to said reaction chamber through a plurality of openings in said lower region at a sufficient velocity to fluidize said granular material in the circulating regime, whereby at least a portion of the granular material is continually entrained upward into said upper region;

(d) means for tangentially supplying a second stream of pressurized air to said upper region of the reaction chamber through at least one opening in said cylindrically shaped interior surface, said second stream being supplied, and said reactor being constructed, in a manner adapted to provide a Swirl number of at least about 0.6 and a Reynolds number of at least about 18,000 in said upper region, thereby creating a cyclone of turbulence in the upper region which increases the rate of reaction in said chamber, wherein, at maximum operating capacity for the reactor, the second stream of air constitutes in excess of about 50% of the total pressurized air fed to the reaction chamber;

(e) means for separating the granular material and the reaction gases exiting from said reaction chamber at a location adjacent to the upper boundary of said cyclone of turbulence, and returning the separated granular material to said lower region of the reaction chamber;



(f) a second fluidized bed fluidized in the bubbling regime and situtated in said lower region of said reaction chamber adjacent a partition formed in said lower region for partitioning said circulating fluidized bed from said second fluidized bed, said second fluidized bed receiving and fluidizing at least a portion of the granular material separated from the reaction gases, said partition being situated so as to permit a portion of the granular material from said second fluidized bed to overflow said partition into said circulating bed; and

(g) first heat exchange surface means immersed in said second fluidized bed for removing heat therefrom.

4,548,139

GRATE FOR INDUSTRIAL FURNACES

Erich Weber, Munich, Fed. Rep. of Germany, assignor to Martin GmbH fur Umwelt- und Energietechnik, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,283

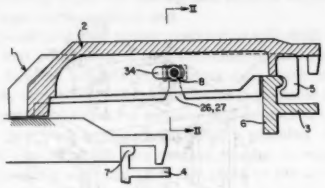
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330636

Int. Cl.⁴ F23H *17/00*

U.S. Cl. 110—328 **11 Claims**

1. In a grate for an industrial furnace or the like, the combination of spaced apart elongated first and second grate bars; a third elongated grate bar disposed between and movable relative to said first and second bars; and means for securing said first and second bars to each other, including an elongated coupling device extending transversely of said bars and having discrete first and second components respectively anchored in said first and second bars and a third component separably connecting said first and second components to each other, said first and second components having coaxial first and second threaded portions and said third component having a third

threaded portion coaxial to and mating with said first and second threaded portions, said third bar having at least one



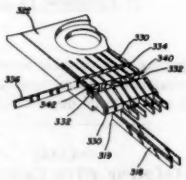
opening through which said device extends and which is sufficiently large to allow said third bar to move with respect to said first and second bars.

4,548,140

NEEDLE PLATE FINGER COMB FOR TUFTING MACHINES

Herbert B. Price, and Ian Slattery, both of Hixson, Tenn., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Jul. 23, 1984, Ser. No. 633,706
Int. Cl.⁴ D05C *15/00*
U.S. Cl. 112—79 R **19 Claims**



1. A mounting comb for a tufting machine for mounting a plurality of elongated needle plate fingers, each finger having a first end defined as a free end and a second end defined as a tail end, said comb comprising a base member including a plurality of slots formed therein, each slot adapted for receiving a respective finger, stop means in said base member for abutting the tail end of said fingers to permit fingers of appropriate lengths to overhang the base by a desired amount, means defining an elongated channel in the base member extending substantially normal to the axis of elongation of said slots intermediate the free ends of said fingers and said stop means, and securing means disposed in said channel and assembled to said base member for releasably holding said fingers in the slots.

4,548,141

APPARATUS FOR APPLYING RIBBON STRIPS TO A TEXTILE FABRIC

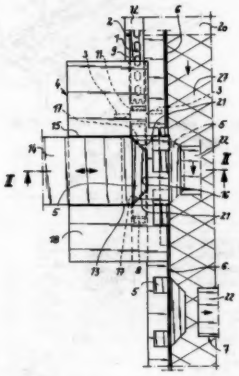
Johannes Freermann, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale GmbH & Co. KG, Ochtrup, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,433
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334646
Int. Cl.⁴ D05B *3/22*
U.S. Cl. 112—113 **7 Claims**

1. In an apparatus for applying a ribbon strip cut and folded from a ribbon band on an edge of a moving textile fabric, fabric piece or the like, wherein said ribbon is fed to a folding unit from a feed unit, said feed unit being coupled to an adjustable ribbon cutting unit so as to produce a folded ribbon strip, said ribbon strip being subsequently conveyed to said textile fabric and inserted under a piece holder positioned above said textile fabric by a conveying unit, said ribbon folding unit comprising a fold plate having two long sides, each of said long sides having a slanting converging fold edge thereon, said fold edges cooperating with two fold plate fingers and being slidable across the path of said ribbon to engage and suitably fold said ribbon strip, the improvement wherein:

said fold plate is formed with an additional fold edge at a leading end of said fold plate parallel to the direction of motion of said textile fabric;

means is provided to feed an additional ribbon to said folding unit so as to be engageable by said additional fold edge,



said additional ribbon being fed so as to be oriented transverse to and at an angle to the plane of said textile fabric;

an additional ribbon-holding clamp is disposed above the position of engagement of said fold plate and said additional ribbon; and

an additional ribbon-cutting unit is mounted so as to be able to cut said additional ribbon held by said additional ribbon-holding clamp so that said fold plate may engage a strip of said additional ribbon to form said folded ribbon strip.

4,548,142

PATTERN ASSIGNMENT SYSTEM

Alan M. Peck, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

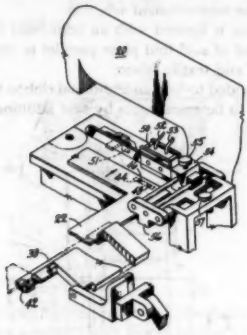
Filed Aug. 31, 1983, Ser. No. 528,367
Int. Cl.⁴ D05B *21/00*
U.S. Cl. 112—121.12 **11 Claims**

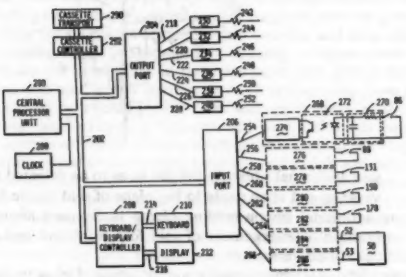
1. A system for processing workpieces each of which is to have one or more predefined stitch patterns sewn thereon, said system comprising:

means for automatically identifying each workpiece when presented to the system; and

means for assigning more than one predefined stitch pattern to the presented workpiece when necessary, said assigning means producing a stored sequence of recallable stitch

patterns that may be repeatedly recalled, said assigning means utilizing the automatic identification of the workpiece in conjunction with one or more communications identifying particular stitch patterns.





4,548,143

METHOD AND APPARATUS FOR VARYING THE LENGTH OR STITCHES SEWN BY A SEWING MACHINE IN DEPENDENCE UPON SEWING SPEED

Charles R. Martell; Donald D. Isett, both of Dallas, and Stephen S. Treadwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Dec. 29, 1983, Ser. No. 566,656

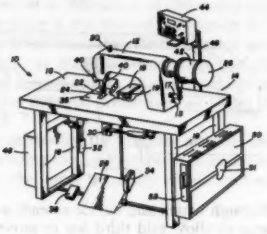
Int. Cl.⁴ D05B *19/00*

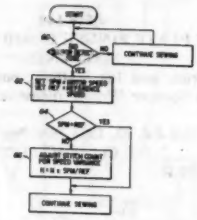
U.S. Cl. 112—121.11 **22 Claims**

1. In a sewing machine having a reciprocable needle for stitching seams in material, seam length control apparatus comprising:

means for detecting a material discontinuity in advance of a seam;

means for controlling the reciprocable needle to sew a variable number of stitches after said detecting means detects said material discontinuity; and





means for adjusting said variable number of stitches to be sewn in dependence upon the sewing speed at the time of detection of said material discontinuity.

4,548,144

SEWING MACHINE WITH CAM TYPE STITCH PATTERN CONTROL

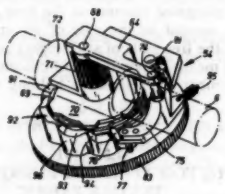
Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinene GmbH, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,123

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330928

Int. Cl.⁴ D05B *3/02, 3/04*

U.S. Cl. 112—465 **9 Claims**



1. In a sewing machine having a frame, a swing arm mounted to the frame, a needle bar guided for reciprocal motion in the swing arm and movable by the swing arm to form a switch pattern, a feed dog movably mounted to the frame for moving a workpiece to form a stitch pattern, and setting means engaged with the feed dog for controlling a feed amount and direction of the feed dog, a stitch pattern control comprising:

a shaft connected to said frame;

a cam block mounted on said shaft at an axially fixed location and for rotation only and having a plurality of cam track portions extending alongside each other;

a contact mechanism engaged with one one of said swing arm and setting means and having a contact finger selectively engageable with one of said cam track portions, a

contact member engageable with each of a plurality of switch cams for switching position of said contact finger, and biasing means for biasing said contact finger against said cam track portions; and

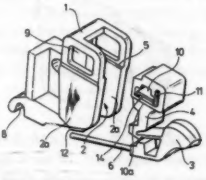
hand-operated setting means mounted to said shaft for rotation and comprising a ring surrounding said cam block and defining an axially extending cam track extending axially with respect to said shaft and engageable with said contact mechanism for moving said contact finger from one cam track portion to another, a plurality of switch cams against which said contact member is engaged for cooperating with said axial cam track to lift said contact finger from one cam track portion against biasing of said biasing means, to thereafter move said contact finger to another cam track portion and to finally bring said contact finger back into engagement with another cam track portion, when said hand-operated setting means is rotated, said contact finger being in direct engagement with said axial cam track.

4,548,145

HOLDER FOR DETACHABLY MOUNTING A PRESSER FOOT

Tomonao Hirose, Tokyo, Japan, assignor to Kohshin Seimitsu Kikai Kabushiki Gaisha, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,127
Int. Cl.[4] D05B *29/12*
U.S. Cl. 112—240 **4 Claims**



1. A holder for detachably holding a presser foot comprising:

a holder body (1) having two opposite side walls (2*a*) defining therebetween a longitudinal recess (2) on the rear side of the holder body, each of said side walls having a window opening (9) in the upper portion thereof and a step (5) rising from the innersurface thereof and extending along the lateral side of the window opening (9), and a front projection (17) integrally connected to the lower portions of the opposite side walls (2*a*) and provided with a cross slit (8) across the nose end of the front projection and a hole (7) extending through the front projection in the direction perpendicular to the cross slit (8); and

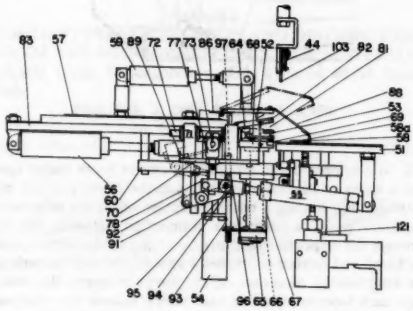
a ruler rod mount (4) having an apertured head equipped with two opposite projections (11) along the rear sides of the aperture (10) of the head, a stem integrally connected to the head and extending downward, a hinge (16) integrally connected to the lower portion of the stem, and a lever (3) integrally connected to the hinge and having a thin rod (6) slanting downward from the free end of the lever, thus permitting the assembly of the holder body and the ruler rod mount by pushing the ruler rod mount in the longitudinal recess of the holder body with the lower lateral edges of the square head of the ruler rod mount positioned on the steps of the side walls of the holder body and with the thin rod (6) of the ruler rod mount inserted in the hole of the front projection of the holder body until the opposite projections (11) of the head of the ruler rod mount (4) are caught by the window openings of the side walls (2*a*).

4,548,146

METHOD OF AND APPARATUS FOR SEWING TOWEL FABRIC END

Takanori Okada, 1941 Minamitahara, Ikoma-shi, Nara-ken, Japan

Filed Dec. 6, 1982, Ser. No. 447,006
Int. Cl.[4] D05B *1/00*
U.S. Cl. 112—262.3 **2 Claims**



1. A method of sewing an end of a towel fabric, comprising the steps of :

cutting a piece of the towel fabric into a certain fixed length with two ends;

conveying the piece of the towel fabric onto a table;

folding at least one of the two ends of the piece of the towel fabric into a two-fold part;

moving an insertion piece into a slit formed between two slit-forming members so that the two-fold part of the piece of the towel fabric is grasped between the two slit-forming members;

withdrawing the insertion piece from the slit while the two-fold part of the piece of the towel fabric is retained in the slit between the two slit-forming members;

releasing the two-fold part of the piece of the towel fabric from the slit between the two slit-forming members by moving the two slit-forming members away from each other;

folding over the two-fold part of the towel fabric to form a three-ply part;

holding down the three-ply part of the piece of the towel fabric by pressing down with a pressing head upon a first end portion of the three-ply part;

clamping down a second opposite end portion of the three-ply part of the piece of the towel fabric so that there is exposed only a third middle portion of the three-ply part; and

sewing the three-ply part of the piece of the towel fabric with sewing thread at a sewing machine on the exposed third middle portion thereof with a pattern of fastening stitches, dense stitches, ordinary stitches, dense stitches, and fastening stitches in that order;

whereby the sewing thread is prevented from slipping out or becoming unsewn at the three-ply part of the piece of the towel fabric.

4,548,147

HOPPER BARGE WITH BOTTOM FLAPS AND A SUCTION CHANNEL

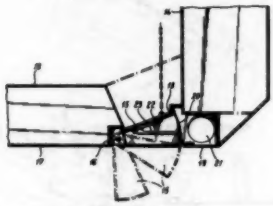
Hans D. H. Roggeveen, Nieuw Lekkerland, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Jan. 31, 1984, Ser. No. 575,542

Claims priority, application Netherlands, Feb. 2, 1983, 8300385

Int. Cl.⁴ B63B *35/30*

U.S. Cl. 114—36 **5 Claims**



1. In a hopper barge comprising one or more cargo spaces and a series of discharge openings in the bottom of the hold, each opening having a bottom flap which in the downwards displaced position realizes a connection between the hold through the respective discharge opening to the water outside the barge and further comprises a suction channel extending in the longitudinal direction of the barge wherein the bottom flaps each have at least one wall which assures the continuity of the channel in case the flaps are completely closed and connects said channel to the hold when the flap is in an intermediate position in which the discharge opening is still closed; the improvement in which each flap comprises a hollow body with a pivot shaft extending along one side of the hollow body and with a wall on the side of the body opposite the pivot shaft, which wall extends concentrically in relation to said shaft from top to bottom of said opposite side of said hollow body, the shafts of all flaps extending substantially parallel to the longitudinal direction of the barge and portions of the barge construction positioned above each other forming sealing and stop means cooperating with each flap in the upper closed position and in the intermediate suctioning position, said portions comprising an upper longituinal edge that stops the flaps in their closed position and a lower longitudinal edge that seals against said opposite wall in the closed and intermediate positions of the flaps.

4,548,148

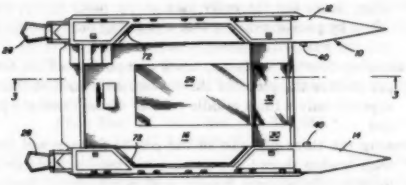
GLASS BOTTOM BOAT

John W. Bloomfield, III, P.O. Box 6427, Hilton Head Island, S.C. 29938

Filed Jan. 25, 1983, Ser. No. 460,894

Int. Cl.⁴ B63B *35/00*

U.S. Cl. 114—66 **6 Claims**



1. A boat including a pair of laterally spaced apart longitudinally extending displacement-type hollow hulls and horizontal connecting structure extending between and interconnecting the hulls to form a unitary buoyant structure, said connecting structure including a large plan area transparent and generally horizontal viewing panel supported therefrom, said boat having a loaded operational water line spaced below said transparent panel, buoyancy varying means operative to selectively flood portions of said hollow hulls to reduce the buoyancy of said hulls and raise said water line to a line above said viewing panel and subsequently pump out said hollow hulls to lower said water line back to said loaded operational water line, the adjacent sides of said hulls and said connecting structure coacting to form an area immediately above said viewing panel of water tight integrity, even when said water line is raised to said level above said viewing panel, said hulls each including inner and outer side portions spaced below said operational water line, said buoyancy varying means including front and rear intake ports formed in front and rear end potions of each of said outer side portions below said water line and forwardly and rearwardly discharging outlet nozzles supported from front and rear portions, respectively, of each of said inner side portions below said water line.

4,548,149

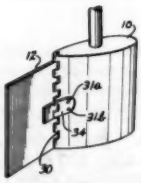
RUDDER FOR AQUATIC CRAFT

Americo Del Rosó, 21858 River Oaks Dr., Rocky River, Ohio 44116

Filed Nov. 4, 1983, Ser. No. 548,655

Int. Cl.⁴ B63H *25/06*

U.S. Cl. 114—162 **2 Claims**



1. A rudder assembly for speedboat type aquatic craft including a main rigid rudder comprising two elongated coacting matched shell portions together forming a bore, a rudder post rotatable about a vertical axis and extending into the bore, a coacting resilient planar fin, the fin extending through the post and being sandwiched between the shell portions, a plurality of bolts extending transversely through the shell portions, the post and the fin to rigidly secure the assembly together, said fin having a preselected resiliency rendering it planar at low craft speeds and bendable to opposite sides of the rigid rudder at a preselected high craft speed and higher so that oversteering is avoided at high craft speeds and low speed turning ability of the craft is substantially enhanced.

4,548,150

READILY REPLACEABLE BUMPER GUARD SUPPORT AND BUMPER FOR WATER COVERED AREAS

Glen E. Drewett, P.O. Box 15, Negreet, La. 71460

Filed Aug. 11, 1982, Ser. No. 407,034

Int. Cl.⁴ B63B *69/02*

U.S. Cl. 114—219 **1 Claim**

1. A replaceable bumper support arrangement for positioning on generally horizontally extending and vertically spaced supports adjacent a water covered area comprising:

a. a hanger for securing to the supports to extend in a downward relationship in the water covered area and to project forwardly of the supports;

b. said hanger having a pair of longitudinally extending sides which are positioned in spaced relation by a third side extending therebetween;

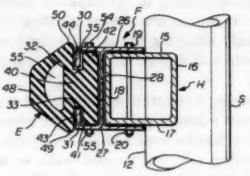
c. a support frame for lowering downwardly in the water covered area adjacent said hanger to extend in a longitudi-

nal, parallel relationship along and projecting forwardly of the hanger;

d. longitudinally extending elongated elastomer body bumper means secured on said support frame;

e. said support frame having longitudinally extending sides positioned in spaced relation by a longitudinally extending plate between said sides whereby said support frame may be guided by said hanger sides as said support frame and elastomer body thereon are lowered downwardly into the water covered area;

f. said support frame having a lower end which terminates



above and in spaced relation to the lower end of said hanger when positioned adjacent thereto in the water covered area;

g. stabbing guide means secured adjacent the lower end of said hanger and projecting therefrom to receive, guide and seat the lower end of said support frame as it and the elongated elastomer body are lowered longitudinally along said hanger in a water covered area; and

h. securing means for removably securing said support frame to said hanger, said securing means being positioned longitudinally of said support frame and hanger for access thereto above the water level in the water covered area.

4,548,151

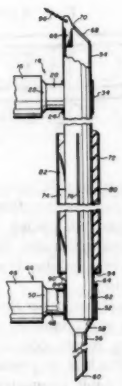
REPLACEABLE MARINE FENDER MECHANISM

James H. Files, and John M. Montague, both of Houston, Tex., assignors to La Salle Marine, Inc., Houston, Tex.

Continuation of Ser. No. 34,771, Apr. 30, 1979, abandoned. This application Jun. 22, 1982, Ser. No. 390,861

Int. Cl.⁴ B63B *59/02*

U.S. Cl. 114—219 **6 Claims**



1. A replaceable marine fender mechanism for protecting a marine structure from damage by impact forces, said fender mechanism comprising:

a lower energy absorbing support being releasably connectable to said marine structure;

an upper energy absorbing support being connectable to said marine structure at a position above said lower energy absorbing support;

an elongated fender post connectable between said upper and lower energy absorbing supports;

a tubular metal wear resisting element being positionable about said fender post and cooperating with said fender post to define chamber means therebetween;

a pair of opposed elongated partition elements extending radially outwardly from said fender post cooperating with said fender post and said wear resisting element to define inner and outer chambers of generally semi-circular cross-sectional configuration; and

an elongated resilient shock absorbing body of generally semi-circular cross-sectional configuration received within said outer chamber.

4,548,152

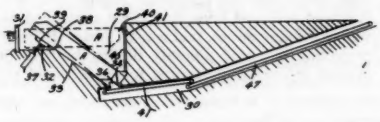
MARITIME TRANSPORTATION AND DISTRIBUTION SYSTEM AND METHOD FOR BULK RAW MATERIALS

Emanuele Iozza, 9 Lungotevere della Vittoria, 00195 Roma, Italy

Filed Feb. 3, 1984, Ser. No. 576,954

Int. Cl.⁴ B65G *67/58*

U.S. Cl. 114—260 **8 Claims**



1. A system for maritime transportation and distribution of bulk raw materials, including in combination: a series of substantially identical watertight barge containers, a barge container carrier vessel, a barge container unloading dock for unloading said material from each barge container, and a barge container loading dock for loading said material into each barge container, each of said barge container having openings in the stern and bow walls for loading and unloading said materials, provided with watertight covers and/or valves, and having no hatches on deck so that said barge containers can be stacked one on the other, said barge container carrier vessel having a hold provided with a port for the flotation loading and unloading of the barge containers into and out of the hold, said hold comprising retention means to lock each barge container in its stowage position to the structure of the carrier vessel, in said stowage position the barge containers being stacked one on the other in a multilayer arrangement, said barge container unloading dock being a sloping bed graving dock comprising a tunnel located underneath the same in communication with the floor of the dock through openings provided with watertight covers, in said tunnel conveyor means being located which lead to a store yard, said barge container loading dock being a sloping bed dock provided with charging hopper means located on the head of the dock and fed by conveyor means.

4,548,153

BUOYANT CONCRETE FOUNDATION AND METHOD THEREFOR

Ernest W. Watchorn, Vancouver, Canada, assignor to Confloat Consulting Ltd., Vancouver, Canada

Filed Jul. 16, 1982, Ser. No. 398,998

Int. Cl.⁴ B63B *3/00*

U.S. Cl. 114—267 **11 Claims**

1. A buoyant concrete foundation for supporting a building structure on a body of water; said concrete foundation comprising, in combination:

(a) a hollow concrete hull comprising a bottom hull wall and upstanding side and end hull walls;

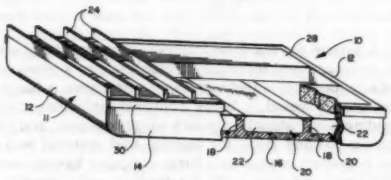
(b) means defining at least one upstanding internal concrete

partial bulkhead wall spanning said hull and having a height less than that of said upstanding side and end hull walls for subdividing the lower region of said hollow concrete hull into a plurality of first positive flotation cavities underlying a single second hollow cavity defined by the upper portions of said upstanding side and end hull walls;

(c) nonenveloped positive flotation block means disposed entirely within each of said first positive flotation cavities for establishing positive buoyancy for said buoyant concrete foundation, said nonenveloped positive flotation block means having their sides profiled to define reentrant sidewall portions having transverse dimensions less than the overall transverse dimensions of said nonenveloped positive flotation block means;

(d) first wedge defining means formed on and integral with said upstanding side and end hull walls at a level intermediate said bottom hull wall and the free upper edges of said upstanding side and end hull walls, said first wedge defining means projecting into said plurality of first positive flotation cavities in overlying relation to the adjacent reentrant sidewall portions of said nonenveloped positive flotation block means for retaining said nonenveloped positive flotation block means captive within said plurality of first positive flotation cavities; and,

(e) second wedge defining means formed on and integral with said at least one upstanding internal concrete partial bulkhead wall and lying in a plane containing said first wedge defining means, said second wedge defining means projecting into said plurality of first positive flotation cavities in overlying relation to the adjacent reentrant



sidewall portions of said nonenveloped positive flotation block means for retaining said nonenveloped positive flotation block means captive within said plurality of first positive flotation cavities, whereby said nonenveloped positive flotation block means, while retained captive within said plurality of first positive flotation cavities, have their upper surfaces freely exposed to said overlying second hollow cavity defined by the upper portions of said upstanding side and end hull walls.

7. The method of fabricating a buoyant concrete foundation for supporting a building structure on a body of water; said method comprising the steps of:

(a) establishing a hollow construction form corresponding to a desired hull configuration and including a bottom hull wall form member and upstanding side and end hull wall form members;

(b) depositing a concrete mixture onto the inner surfaces of the bottom, side and end hull wall form members to form a hollow concrete hull having a bottom hull wall and integral upstanding side and end hull walls;

(c) positioning a plurality of nonenveloped positive flotation blocks, each having a height less than the height of the upstanding side and end hull wall form members and each having their sides profiled to define reentrant sidewall portions having transverse dimensions less than the overall transverse dimensions of the nonenveloped positive flotation blocks, on the concrete mixture deposited on the bottom hull wall form member and in contact with the concrete mixture deposited on the upstanding side and/or end hull wall form members prior to curing thereof and with the plurality of positive flotation blocks being disposed in a spaced array on the bottom hull wall to yield channels intermediate adjacent flotation blocks spanning the interior of the hull;

(d) depositing a concrete mixture within the channels between adjacent nonenveloped positive flotation blocks and in overlying relation to the adjacent reentrant sidewall portions of the nonenveloped positive flotation blocks to form at least one upstanding interior concrete partial bulkhead wall spanning the hull and having a height equal to the height of the nonenveloped positive flotation blocks and for forming first wedge defining means integral with and projecting laterally from the upstanding interior concrete partial bulkhead wall(s) in overlying relation to the adjacent reentrant sidewall portions on the nonenveloped positive flotation blocks for captively retaining the same in the lower portion of the concrete hull defined by the upstanding side and end hull walls;

(e) depositing a concrete mixture in the region overlying the reentrant sidewall portions of the nonenveloped positive flotation blocks intermediate the blocks and the adjacent upstanding side and/or end walls so as to form second wedge defining means integral with and projecting laterally inward from the upstanding side and end hull walls for captively retaining the nonenveloped positive flotation blocks in the lower portion of the concrete hull defined by the upstanding side and end hull walls;

(f) curing the concrete deposited in steps (b), (d) and (e); and,

(g) separating the cured buoyant concrete foundation thus formed from the bottom, side and end wall construction form members.

4,548,154

DOUBLE HULLED SHIP WITH LONGITUDINAL REINFORCEMENTS

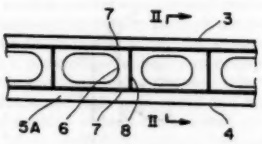
Seiichiro Murata, Sakai; Toshio Yoshioka, Kawachi-nagano; Sakito Kamei, Sakai; Yoshitada Hiramatsu, Kishiwada; Shin Takeuchi, Arao, and Yoshiro Yamawaki, Innoshima, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jul. 6, 1984, Ser. No. 628,468

Claims priority, application Japan, Jul. 11, 1983, 58-107856[U]

Int. Cl.⁴ B63B *3/68*

U.S. Cl. 114—355 **2 Claims**



1. A ship having at least its side portions and bottom portion comprised of a double hull construction consisting of an inner hull plating and an outer hull plating connected together by transverse bulkheads and a plurality of connecting longitudinals fixed to the transverse bulkheads and reinforced by anti-buckling means, wherein

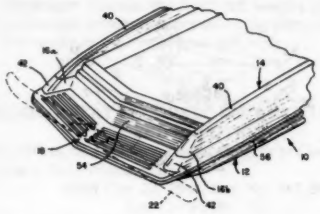
(a) there are no transverses, other than said transverse bulkheads, intersecting said connecting longitudinals, and

(b) said anti-buckling means comprises a pair of parallel straight flat bars attached perpendicularly to and extending lengthwise of each connecting longitudinal in the bottom portion of the ship and a plurality of parallel straight flat bars attached perpendicularly to and extending widthwise of each bottom portion connection longitudinal between the lengthwise extending bars, both ends of each widthwise extending bar being in contact with the lengthwise extending bars.

4,548,155
BOAT INCLUDING SWIM PLATFORM

Allan B. Hegg, Manistee, and James S. Phares, Farmington Hills, both of Mich., assignors to Century Boat Company, Manistee, Mich.

Filed Aug. 20, 1984, Ser. No. 642,551
Int. Cl.[4] B63B 17/00
U.S. Cl. 114—362 1 Claim

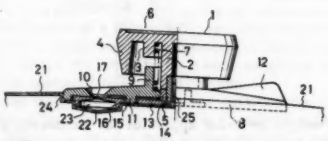


1. A one-piece upper shell for a ski boat comprising:
a pair of sidewalls each including a rear edge; and
a swim platform at the stern of said boat integral with and extending between said sidewalls, said swim platform including a rear edge, said sidewall rear edges meeting said swim platform forwardly of said swim platform rear edge a distance at least approximately equal to the width of a conventional water ski, said swim platform including an aft portion extending rearwardly from a straight line drawn between the junctions of said sidewall rear edges and said swim platform, whereby said aft portion can support a conventional water ski extending beyond one of said sidewalls.

4,548,156
LID KNOB OF PRESSURE COOKER

Yoshikazu Shibata, Tokyo, Japan, assignor to Japan Life Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,242
Int. Cl.[4] G10K 5/00; G08B 3/00; A47J 36/06
U.S. Cl. 116—70 3 Claims

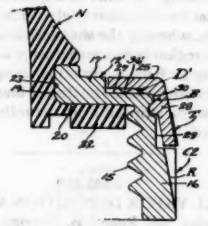


1. A lid knob for a pressure cooker, comprising a thumb which is composed of a middle shaft secured to a female tube, a middle wall, said middle shaft and said middle wall defining a space holding a spring, and a skirt defining an outer circumference of said thumb; a dish-shaped stand which is centrally provided with a sleeve for receiving the middle shaft and the spring, said stand having a hole therein communicating with a steam hole formed in a lid of said pressure cooker, said stand having a downwardly extending stopper; a guide plate which is centrally provided with a sleeve for receiving an exposed portion of the female tube and which also defines a guide hole for the stopper, said guide plate provided on a reverse side of a circumferential part thereof with a fitting portion to be fitted in a whistling depression defined in said lid, said guide plate being open centrally of the fitting portion to form a steam hole communicating with the steam hole of said lid; means, fitting within said female tube, for mounting said lid knob to said lid.

4,548,157
SANITARY SCHEDULING DEVICE FOR DISPENSER CLOSURES

Varoujan H. Hevoyan, Los Angeles, Calif., assignor to Timothy L. Chrisman, Manhattan Beach, Calif.

Filed Feb. 10, 1984, Ser. No. 579,220
Int. Cl.[4] G09F 11/04; A61J 7/00
U.S. Cl. 116—308 13 Claims

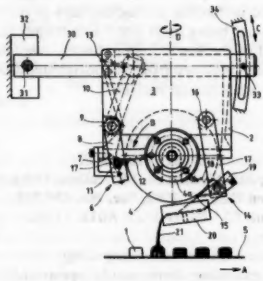


1. A time reminder device for a closure of a container and including, a crown member with a top step adjoining a peripheral step, a rotatably positionable ring member having an inturned flange occupying said top step and a downturned rim occupying said peripheral step, anchor means releasably securing the ring member to the crown member, equally spaced time marks on one of said members and an index mark on the other member, and detent means comprised of indentations in one of said members equal in number to said spaced time marks and a projection on the other member to engage individually therein, at least one member being resilient to permit selected positioning of said rotatably positionable ring member.

4,548,158
DEVICE FOR APPLYING A FLOWABLE FAT COMPOSITION TO OBJECTS

Helmut Sollich, Bad Salzuflen, Fed. Rep. of Germany, assignor to Sollich GmbH & Co. KG, Bad Salzuflen, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,842
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336259
Int. Cl.[4] B05C 5/00
U.S. Cl. 118—24 4 Claims



1. A device for applying a flowable fat composition to objects, comprising:
a storage tank for the flowable fat composition, the storage tank having an opening,
a roller rotatable with respect to the storage tank, a portion of the roller surface, at any one time, covering the storage tank opening so that it will dip into a fat composition within the storage tank,

means defining an edge of the container opening, that edge being spaced from the roller a distance in the range between 0.2 and 3.0 mm, and that edge and the roller determining the thickness of the fat composition carried by the roller out of the storage tank,

a doctor blade circumferentially spaced, along the surface of the roller, from the edge-defining means, the doctor blade engaging the roller surface for stripping the layer of fat composition from the roller,

means for rotating the roller at a speed between 50 and 800 rpm, so that its circumferential velocity is between 20 and 320 m/min, whereby the shear effect on the fat composition in the region between said edge and the roller serves to eliminate air bubbles from the composition, and

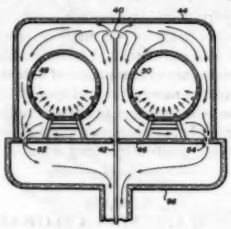
a discharge chute beneath the doctor blade for directing the fat composition stripped from the roller on to the objects to be coated.

4,548,159

CHEMICAL VAPOR DEPOSITION WAFER BOAT

Derrick W. Foster, and Robert B. Herring, both of San Jose, Calif., assignors to Anicon, Inc., San Jose, Calif.

Filed Jul. 6, 1984, Ser. No. 628,542
Int. Cl.[4] C23C *11/00*
U.S. Cl. 118—728 **8 Claims**



1. A cylindrical chemical vapor deposition wafer boat comprised of mutually engaging upper and lower hemicylinders, the lower hemicylinder having slot means for supporting a plurality of wafers in a preset spaced orientation perpendicular to the central axis of the cylinder and having gas diffusion openings in a gas diffusion zone, the lower hemicylinder having legs at each end thereof for supporting the wafer boat at least 2 mm above a suport surface and for engaging a wafer boat loading and unloading means, the legs at one end of the lower hemicylinder being from 2 to 5 mm longer than the legs at the other end of the lower hemicylinder, whereby the central axis of the boat is sloped from the horizontal when the boat is supported by a horizontal surface.

4,548,160

CAT LITTER BOX

Ira S. Feitelson, 315 Mission St. SE., Salem, Oreg. 97302

Filed Oct. 26, 1982, Ser. No. 436,782
Int. Cl.[4] B65D *5/22*; A01K *23/00*
U.S. Cl. 119—1 **13 Claims**

1. A disposable cat litter box comprising:

(a) a bottom extending horizontally upon which cat litter may be placed;

(b) end walls secured to and adapted to extend vertically from said bottom;

(c) side walls secured to and adopted to extend vertically from said bottom;

(d) outwardly angled ends secured to said end walls and adapted to extend angularly to said end walls;

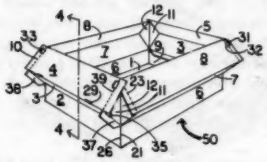
(e) inwardly angled ends secured to and adapted to extend angularly to said outwardly angled ends;

(f) downwardly angled ends secured to and adapted to extend flush with said inwardly angled ends;

(g) means for locking said downwardly angled ends flush against said inwardly angled ends;

(h) outwardly angled sides secured to said side walls and adapted to extend angularly to said side walls;

(i) inwardly angled sides secured to and adapted to extend angularly to said outwardly angled sides;



(j) means for securing said inwardly angled sides and said outwardly angled sides to said outwardly angled ends, said inwardly angled ends, and said downwardly angled ends;

(k) means for sealing adjacent inwardly angled sides;

(l) means for unsealing adjacent inwardly angled sides; and

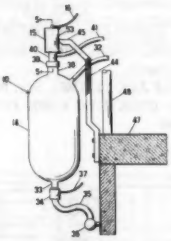
(m) means for resealing adjacent inwardly angled sides.

4,548,161

MILK WEIGHT METERING METHOD AND APPARATUS

Rolf W. Reisgies, Waunakee, Wis., and Michael L. Kvalo, Safety Harbor, Fla., assignors to Germania Dairy Automation, Inc., Waunakee, Wis.

Filed Aug. 8, 1983, Ser. No. 521,412
Int. Cl.[4] A01J *9/08*
U.S. Cl. 119—14.17 **9 Claims**



1. Milk weight metering apparatus for measuring the milk produced by a cow during a milking cycle, comprising:

(a) a milk weigh jar having an upwardly extending neck and an open mouth at the top thereof, an outlet for milk from the jar, and an inlet to the jar for flow therein of the milk from a milking machine at the cow;

(b) a load cell milk weight measuring unit comprising:

(1) a load cell housing,

(2) means for attaching the milk weigh jar to the bottom of the housing,

(3) upper and lower load cell bodies mounted in the load cell housing, the upper and lower load cell bodies having interior cavities, the cavity within the lower load cell body adapted to have a cylindrical plunger inserted therein,

(4) a flexible diaphragm mounted between the upper and lower load cell bodies to seal off the cavities therein from each other,

(5) a hydraulic output line connected at one end to be in communication with the cavity in the upper load cell

body and extending to a position remote from the position of the weigh jar, hydraulic fluid filling the interior cavity of the upper load cell body and the hydraulic line;

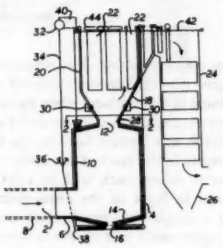
(c) a mounting bracket adapted to be mounted to a structure in the milking parlor and having a cantilevered arm portion with an upright plunger at the end thereof, the plunger adapted in size and shape to fit into the cavity in the lower load cell body and to apply pressure to the diaphragm therein, the load cell weight measuring unit and weigh jar being supported on the plunger inserted into the cavity in the lower load cell body.

4,548,162

SLAGGING HEAT RECOVERY UNIT WITH POTASSIUM SEED RECOVERY

Mark Palkes, Glastonbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1984, Ser. No. 663,296
Int. Cl.⁴ F22D *1/00*
U.S. Cl. 122—7 R **3 Claims**



1. A heat recovery unit for cooling a high temperature reducing gas mixture, said gas mixture including a first and a second gaseous species, each species being condensable at respective first and second condensation temperatures, comprising:

a dwell furnace lined with water-cooled refractory for receiving said high temperature reducing gas mixture and for cooling the received gas mixture to an exit temperature both less than the first condensation temperature and greater than the second condensation temperature,

a convection furnace for cooling the gas mixture exiting the dwell furnace to a temperature less than the second condensation temperature, the convection furnace being disposed above the dwell furnace and containing a plurality of heat transfer surfaces therewithin;

a vertical transition duct, disposed between the dwell furnace and the convection furnace, for directing the flow of gas therebetween, the duct further including a restricted flow area portion for providing increased gas velocity therethrough, thereby preventing reentry of any condensed material into the dwell furnace from the convection furnace; and

a secondary air nozzle, disposed within the transition duct, for supplying additional oxidant to the gas mixture entering the convection furnace.

4,548,163

HIGH EFFICIENCY FLUID HEATER

George H. Siedhoff, 145 N. Terrace, Wichita, Kans. 67208

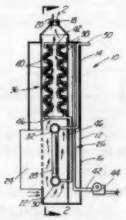
Filed Jun. 6, 1984, Ser. No. 617,897
Int. Cl.⁴ F22B *9/02*; **F21B** *21/00*
U.S. Cl. 122—13 R **2 Claims**

1. A high efficiency fluid heater for heating a fluid such as water and the like, the heater comprising:

a flue housing having an upper portion and a lower portion, the upper portion having a flue gas outlet, the lower portion having an air inlet for receiving combustion air which is discharged upwardly;

an infrared heater mounted in the lower portion of the housing;

a scrubber section mounted in the upper portion of the housing, the scrubber section having a plurality of interconnected pipe coils disposed along the length of the upper housing, the pipe coils having fins disposed thereabout for increasing the heat exchange of the air circulated therearound, the coils connected to a fluid inlet pipe at the top of the upper portion of the fluid housing for receiving the fluid to be heated therein and circulating the fluid downwardly therefrom, the coils connected to a connecting pipe at the bottom of the upper portion for discharging intermediate heated fluid therefrom;



a contact section mounted in the lower portion of the housing and in front of the infrared heater for receiving direct radiation therefrom, the contact section having a plurality of fluid passages therein for circulating fluids therethrough, the fluid passages connected to a connecting pipe at the bottom of the lower portion of the housing for receiving the intermediate heated fluid, the fluid passages connected to a discharge pipe at the top of the lower portion of the housing for discharging final heated fluid circulated upwardly in a concurrent flow direction to the rising air, the air inlet diposed below the contact section for heating the rising air by convection prior to the heated air being received through the scrubber section; and

a fluid pump connected to the fluid inlet pipe for circulating the fluid, under pressure, into the heater.

4,548,164

ENGINE DRIVEN GENERATOR ASSEMBLY

Paavo Ylönen; Urpo Hirvikoski, both of Nokia; Esa Piippo, Mouhijärvi, and Pentti Rajala, Linnavuori, all of Finland, assignors to Valmet OY, Finland

Filed Jan. 29, 1985, Ser. No. 696,094
Claims priority, application Finland, Feb. 9, 1984, 840537
Int. Cl.⁴ F02B *63/04*
U.S. Cl. 123—2 **14 Claims**

1. An internal combustion engine driven generator assembly, comprising:

a thermally and acoustically insulated housing including a substantially rigid frame to which insulation elements are attached, said frame and insulation elements constituting housing walls;

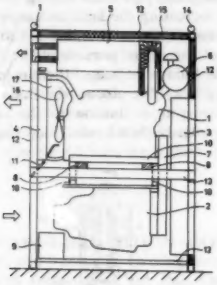
a generator mounted in said housing, said generator having a substantially horizontal generator shaft;

an internal combustion engine mounted in said housing substantially vertically over said generator, said engine having a substantiall horizontal crankshaft situated substantially in the same vertical plane in which said generator shaft is situated;

said generator and engine being suspended from said housing frame;

a fuel tank for said engine, said fuel tank constituting at least a part of a wall of said housing for providing lateral stiffening reinforcement therefor;

an intake air port, an exhaust air port and an aperture adapted to receive an exhaust pipe, said air ports and exhaust pipe aperture being provided in a common housing wall, said intake air port being situated below said exhaust air port and said exhaust air port being situated below said exhaust pipe aperture; and



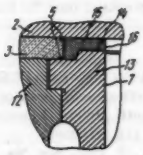
a ventilation module adapted to be mounted in said common housing wall in which said air ports and exhaust pipe aperture are formed, said ventilation module including apertures formed therein through which intake and exhaust air ar adapted to pass respectively, louver means for opening and closing said apertures, and a fitting for connection to an exhaust pipe mounted in said exhaust pipe aperture.

4,548,165

INTERNAL COMBUSTION ENGINE

Ivan Y. Vorobiev; Viktor M. Zharnov, and Viktor D. Naumenko, all of Minsk, U.S.S.R., assignors to Minsky Motorny Zavod, Minsk, U.S.S.R.

Filed Sep. 13, 1983, Ser. No. 531,714
Int. Cl.[4] F02F *11/00*; F16J *15/06*
U.S. Cl. 123—41.84 **3 Claims**



1. An internal combustion engine comprising:
an engine block;
a cylinder head;
a cylinder head gasket interposed between said engine block and said cylinder head;
cylindrical bores defined by the engine block
a cylinder liner located within each cylndrical bore, said cylinder liners each including a stepped cross-section having an upper surface defining a fire shoulder and an end face;;
cylindrical holes defined by the cylinder head gasket, said cylindrical holes having a diameter greater than the internal diameter of the cylindrical liners; and
annular shaping rims located in said cylindrical holes of said gasket, each annular shaping rim including a deformable body and elements securing said shaping rim to said cylinder head gasket, said deformable body being of a stepped configuration, a stepped portion of said deformable body engaging by one step said end face of said cylinder liner and engaging by another step said fire shoulder, said deformable body further engaging said cylinder head

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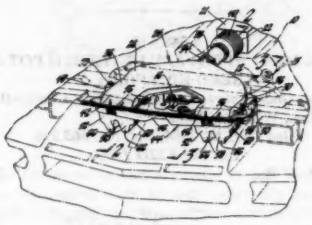
4,548,166

ENGINE AIR CLEANER AND DUCT ARRANGEMENT

William E. Gest, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1985, Ser. No. 689,467
Int. Cl.[4] F02B *77/00*; B01D *50/00*
U.S. Cl. 123—52 M **4 Claims**



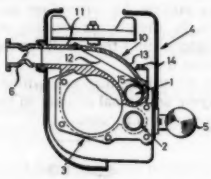
1. An engine air cleaner and duct arrangement for a vehicle having an engine mounted in front therein underneath a hood wherein a vehicle body cross-member extends underneath the hood with clearance space therebetween of smaller height than width and a latch mechanism latches the hood to the cross-member intermediate the ends of the latter: characterized by a pair of air cleaner means each with an inlet and an outlet and mounted on and in front of the cross-member, and air duct means having a single delivery branch connected to an air intake of the engine and a pair of feeder branches connected to the respective air cleaner outlets, said feeder branches being of smaller cross-sectional height than width so as to extend through the otherwise unused space between the cross-member and hood and on opposite sides of the latch mechanism and join with the single delivery branch at a location rearward of the cross-member and connect with the air cleaner outlets at locations forward of the cross member.

4,548,167

SUCTION AIR PASSAGE OF INTERNAL COMBUSTION ENGINE

Shinichi Tamba, Kakogawa; Masato Sato, Akashi; Kozo Watanabe, Ono, and Masanobu Yamashita, Miki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 28, 1984, Ser. No. 645,164
Claims priority, application Japan, Aug. 31, 1983, 58-159361
Int. Cl.[4] F02F *1/42*
U.S. Cl. 123—41.56 **3 Claims**



1. A suction air passage of the side-valve type of internal combustion engines having a suction valve and an exhaust valve side by side with each other on one side of a cylinder, a silencer outside of said exhaust valve, and a carburetor almost diagonally to the silencer on an opposite side of the cylinder, said suction air passage being characterized by the suction air passage from the carburetor to the suction valve being composed of a pipe-shaped portion which is partly curved along a

bore of the cylinder for integration into the cylinder and being opened at a curved outside wall thereof to form an open surface, and a separate cover which is fixed to the open surface of said curved pipe-shaped portion.

4,548,168

THREADED TAPPET ADJUSTER

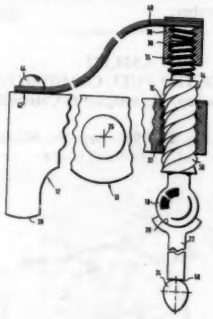
Peter J. Gill, Wolverhampton, England, assignor to GKN Screws & Fasteners Limited, Wednesbury, England

Continuation-in-part of Ser. No. 366,050, Apr. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 120,492, Feb. 11, 1980, abandoned. This application Apr. 4, 1984, Ser. No. 596,668

Claims priority, application United Kingdom, Jan. 12, 1980, 8001089

Int. Cl.⁴ F01L *1/22*

U.S. Cl. 123—90.54 **3 Claims**



1. A valve operating mechanism for a poppet valve of an internal combustion engine including a cam rotatable to apply lifting forces to the valve through the intermediary of an automatic clearance adjuster;

the adjuster including two components arranged for transmission of the valve lifting forces from the cam to the valve and comprising co-operating screw threads of buttress thread form so formed as to provide a predetermined axial free play between the two components;

axially directed spring loading means acting between the components in a sense opposite to the transmission of valve lifting forces between the components such that, when no valve lifting force is being tramsmitted from the cam, the spring loading urges the threads axially into engagement so that the reactions between the engaged threads causes relative rotation of the two components to take up rotational positions such that the clearance in the mechanism is equal to the predetermined axial free play between the screw buttress threads;

the buttress thread form of each said component having a helix angle H, a first flank termed the running flank and having angle G_R and a second flank termed the locking flank and having angle G_L satisfying the conditions that:

(a) tan $H > \mu_{MAX}$ sec G_R

(b) tan $H < \mu_{MIN}$ sec G_L and

(c) cot $G_L > \mu_{MAX}$ cos H

where μ_{MAX} and μ_{MIN} are respectively the highest and lowest expected values of the co-efficient of friction between the co-operating flanks of the threads of said components whereby the screw buttress threads exhibit a high friction between the locking flanks having said second flank angle G_L under valve lifting forces transmitted from the cam compared with the friction between the running flanks having said first flank angle G_R under forces transmitted from the spring loading; whereby upon application of valve lifting forces by the cam the locking flanks frictionally engage and prevent rotation between the components, and when the cam applies no valve lifting forces but the spring applies axially directed loading means acting between the two components the resulting frictional engagement between running flanks permits rotation between the components and an increase in their overall relative length until clearance in excess of the buttress thread free play clearance is eliminated.

4,548,169

CARBURETOR CHAMBER

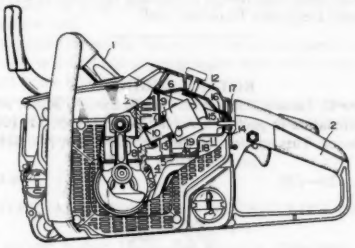
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,630

Claims priority, application Japan, Aug. 1, 1983, 58-140710

Int. Cl.⁴ F02B *77/02*

U.S. Cl. 123—195 C **3 Claims**



1. In a chain saw having an engine cylinder at its top and an engine crank case at its lower part, with a carburetor arranged at a rear part, apart from said cylinder; a carburetor chamber arrangement characterized in that an air-fuel mixture outlet of said carburetor is communicated with a suction port of said cylinder through a gas pipe made of a heat insulation material; a substantially horizontal flat portion is provided at a position located rearwardly of a top portion of said crank case by extending said top portion; and a casing separate from said crank case having an opening at its top and which is fixed on said flat portion, said casing being provided, at its interior, with said carburetor and, at its bottom wall, integrally formed along therefor with a path of feeding under pressure chain lubricating oil therewithin and, at its rear wall, with a through hole for permitting the passage therethrough of a throttle valve operation lever for said carburetor and, at its front wall, with an attachment section for said gas pipe and, at said opening at its top, with an air filter, said communication of said air-fuel mixture outlet of said carburetor with said suction port of said cylinder being effected through said gas pipe so that a connecting of said gas pipe with said suction port may be effected slidably and in a sealed condition.

4,548,170

LONGITUDINAL HOUSING WALL OF AN INTERNAL COMBUSTION ENGINE

Peter Forsthuber, Klosterneuburg; Tomas Visek, Steyr, and Anton Dolenc, Vienna, all of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Apr. 20, 1984, Ser. No. 602,324

Claims priority, application Austria, Apr. 27, 1983, 1528/83

Int. Cl.⁴ F02F *7/00*

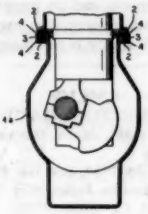
U.S. Cl. 123—195 A **16 Claims**

1. In a longitudinal housing wall for an internal combustion engine, which wall is formed with an elongated channel defined by two confronting parallel surfaces, the improvement wherein

said channel opens outwardly, is parallel to the longitudinal dimension of said wall and is rectilinear; and

a rectilinear rod lying in and extending in said channel over at least two-thirds of the length of said channel parallel

thereto and to said surfaces and is coupled to said wall so as to be resiliently movable relative to said wall and capable of absorbing energy of flexural vibration at a predetermined frequency from said wall.



4,548,171

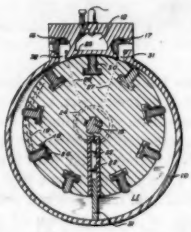
ROTARY ENGINE

Theodore G. Larson, 828 1st St. North, Sartell, Minn. 56377

Continuation-in-part of Ser. No. 540,312, Oct. 11, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 631,906

Int. Cl.⁴ F02B *53/06*

U.S. Cl. 123—230 **16 Claims**



1. A rotary engine comprising a housing having a main chamber and at least one discrete and smaller combustion chamber spaced apart from said main chamber, said main chamber being defined by opposing side surfaces and by an endless circumferential surface bridging between said side surfaces and defining the axis of said main chamber, the intersection between all planes prependicular to the axis of said main chamber and said endless circumferential surface thereof being a circle, a rotor within aid main chamber with a fixed axis of rotation parallel to but spaced from the axis of said main chamber and with lateral sides of said rotor in juxtaposed relationship to said main chamber side surfaces, a rotatable drive shaft mounted in said housing at the axis of said rotor and rotated by said rotor, plural passage means for communication between said combustion chamber and main chamber and for intake of cumbustion supporting fluid into and exhaust of burned fluid from said main chamber, and valve means disposed in said passage means, wherein

said rotor includes (i) a plurality of radially-projecting sealing members in spaced relationship thereabout for maintaining said rotor at all times during rotation thereof in a fluid-sealed condition with respect to said circumferential surface of said main chamber along a single fixed transverse strip area across said circumferential surface, said radially projecting sealing members having end portions thereof at the lateral sides of said rotor, said radially-projecting sealing members being the sole sealing means for maintaining said fluid-sealed condition along said fixed strip area, there being no seal means on the circumferential surface of said main chamber for forming any fluid-sealed condition at said fixed strip area, (ii) piston means consisting of a single radially-oriented axially-parallel piston vane recessible within said rotor and biased during rotation of said rotor to extend radially outward to thereby maintain the radially-outward end thereof at all times in pressing contact relationship with the circumferential surface of said main chamber during rotation of said rotor, said piston vane being moved through said fixed strip area of said main chamber at each revolution of said rotor, and (iii) lateral sealing members for effecting a fluid-sealed condition between said rotor lateral sides and said main chamber side surfaces, said lateral sealing members being carried on lateral sides of said rotor between and portions of said radially-projecting sealing members, and

said passage means are entirely within said housing, with the porting thereof to and from said main chamber exclusively at locations adjacent said fixed strip area, said porting comprising two ports on each side of said fixed strip area, with all ports on each side of said fixed strip area in an alignment transverse to the circumferential surfaces of said main chamber.

4,548,172

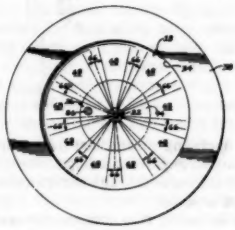
IGNITION-ASSISTED FUEL COMBUSTION SYSTEM

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 22, 1983, Ser. No. 506,941

Int. Cl.⁴ F02M *61/14*

U.S. Cl. 123—298 **4 Claims**



1. A fuel combustion system (10) of a direct-injection internal combustion engine (14) including an open combustion chamber (18), a fuel injection nozzle (22) projecting directly into said open combustion chamber (18) and having a plurality of primary fuel spray orifices (62) adapted during engine operation to simultaneously spray distinct and mutually spaced primary fuel streams (66) radially outwardly into the open combustion chamber (18), the improvement comprising:

means (26) for initiating localized ignition and flaming of fuel in the open combustion chamber (18), said fuel ignition-initiating means (26) being adapted to be energized to an elevated fuel igniting temperature during engine operation and projecting directly into said open combustion chamber (18); and

means (30) for propagating the flame, started by said fuel ignition-initiating means (26), to those primary fuel streams (66) which would not otherwise be directly ignited by said fuel ignition-initiating means (26), said flame-propagating means (30) including means (90) for simultaneously and interconnectedly bridging all of said primary fuel streams (66) with an auxiliary cloud (94) of fuel, wherein said interconnectedly-fuel-bridging means (90) includes a secondary fuel spray orifice (98) also disposed on said fuel injection nozzle (22) and an impingement surface element (102) having a preselected shaped deflecting face (106) unobstructively spaced from and facing said secondary fuel spray orifice (98), said secondary fuel spray orifice (98) adapted during engine operation to simultaneously spray a secondary fuel stream (110) at said deflecting face (106) so that the secondary fuel stream (110) is

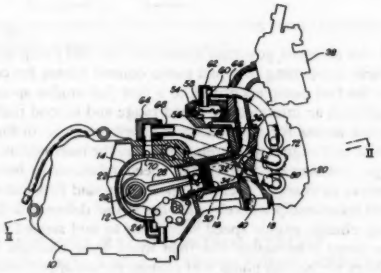
controlledly deflected radially outwardly to form said auxiliary cloud (94) of fuel which interconnectedly bridges all of said primary fuel streams (66), said secondary fuel stream being of the same composition as the primary fuel streams (66) and wherein either one of said primary fuel streams (66') or said auxiliary cloud (94) of fuel is adapted during engine operation to contact and to be directly ignited by the fuel ignition-initiating means (26).

4,548,173

SECONDARY INTAKE DEVICE

Toshio Yabumoto; Hiromu Sakaoka, and Koji Nakajima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1984, Ser. No. 569,954
Claims priority, application Japan, Jan. 12, 1983, 58-3199
Int. Cl.⁴ F02B *33/00*
U.S. Cl. 123—308 **7 Claims**



1. A secondary intake device for an internal combustion engine having an intake passage, a crankcase, intake valving and a piston, including

a supply pump having a pump chamber and a diaphragm dividing said pump chamber;

a secondary intake passage extending between said pump chamber on one side of said diaphragm and the intake passage in front of the intake valving;

a pump passage extending between the crankcase and said pump chamber on the other side of said diaphragm; wherein the improvement comprises

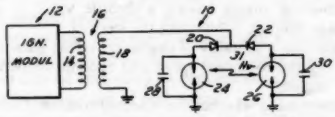
a control valve in said pump passage, said pump passage being closed by said control valve throughout the power cycle of the piston.

4,548,174

DUAL PLUG IGNITION SYSTEM

Richard W. Anderson, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 28, 1984, Ser. No. 655,269
Int. Cl.⁴ F02P *3/04*
U.S. Cl. 123—310 **4 Claims**



1. An ignition system for an internal combustion engine having at least one cylinder comprising:

an ignition coil having a primary winding and a secondary winding, said secondary winding having a first and a second output terminal;

an ignition control circuit for applying a charging current to the primary winding of the ignition coil and for interrupting said charging current;

a first and a second spark ignition plug provided for each cylinder of the engine, each of said ignition plugs having at least one gap formed by first and a second spaced apart electrodes, said first and second plugs being positioned in the cylinder so as to be optically coupled to each other so that ultraviolet radiation from the first plug to fire in the cylinder is coupled to the other plug in the cylinder and aids in the firing of the other plug;

first and second connecting means for connecting said first spaced apart electrode of each gap of said first and second plugs, respectively, to ground;

a first diode coupled between said second electrode of said first plug and said first output terminal of said ignition coil;

a second diode coupled between said second electrode of said second plug and said first output terminal of said ignition coil;

a first capacitor means for providing a capacitance coupled across said first and second spaced apart electrodes of said first spark ignition plug; and

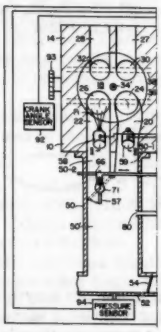
a second capacitor means for providing a capacitance coupled across said first and second spaced apart electrodes of said second spark ignition plug.

4,548,175

INTERNAL COMBUSTION ENGINE WITH TWO INTAKE VALVES

Taiyo Kawai; Nobuo Habu, and Shinichi Matsumoto, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 3, 1984, Ser. No. 677,746
Claims priority, application Japan, Dec. 5, 1983, 58-228329; Dec. 19, 1983, 58-237961; Apr. 9, 1984, 59-69176
Int. Cl.⁴ F02B *29/02;* F02M *35/10*
U.S. Cl. 123—308 **11 Claims**



1. An internal combustion engine, comprising:

a cylinder block defining a cylinder bore;

a cylinder head arranged on the cylinder block;

a piston movably arranged in the cylinder bore so that a combustion chamber is formed between the cylinder block cylinder head, and the piston;

said cylinder head having a first intake port of a helical shape and a second intake port of a straight shape;

a first intake valve arranged between the first intake port and the combustion chamber,

a second intake valve arranged between the second intake port and the combustion chamber,

said cylinder head having at least one exhaust port;

an exhaust valve arranged between the exhaust port and the combustion chamber;

intake valve control means for controlling the operation of the first and the second intake valves;

exhaust valve control means for controlling the operation of the exhaust valve;

a spark plug having a spark gap located in the combustion chamber at its top portion in the center;

intake pipe means connected to the first and second intake ports for introduction of intake air;

intake control valve means for controlling the supply of air from the intake pipe means to the second intake port of a straight shape;

actuator means responsive to operating conditions of the engine for controlling the opening of the intake control valve means;

main injector means for generating a flow of fuel in the second intake port;

first injection control means for controlling the fuel injection from the main injector means in such a anner that the flow of fuel is injected substantially at the intake stroke of the piston when the intake control valve is closed; and

second injection control means for controlling the main fuel injection from the injector means in such a manner that the flow of fuel is injected at a crank angle area substantially other than that of the intake stroke then the intake control valve is opened.

4,548,176

ROTATING MECHANISM OF THROTTLE VALVE FOR FUEL SUPPLY DEVICE OF INTERNAL COMBUSTION ENGINE

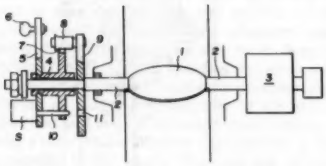
Takashi Ishida; Kenshi Shimizu, both of Kanagawa, and Shuichi Kamiyama, Tokyo, all of Japan, assignors to Mikuni Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,431

Claims priority, application Japan, Oct. 14, 1983, 58-192664

Int. Cl.⁴ F02M *19/12*

U.S. Cl. 123—342 **5 Claims**



1. A rotating mechanism of a throttle valve for a fuel supply device of an internal combustion engine comprising:

an actuator for opening the throttle valve mounted on a throttle shaft upon depressing of an accelerator, said actuator being coupled to one side of the throttle shaft;

a cam lever pivotally secured to an opposite side of the throttle shaft and having a cam set to open the throttle valve more than the movement of said actuator upon depressing of the accelerator, said cam lever being coupled to the accelerator through a link lever;

a throttle lever for coupling the cam lever to the throttle shaft; and

an engaging member mounted on a cam lever side of said throttle shaft for selectively taking an engaging position or a nonengaging position relative to the throttle lever, said engaging member being operated to take the engaging position with respect to the throttle shaft when said actuator becomes impossible to operate, the engaging member being located on said link lever and engaging a hole formed in said throttle lever.

4,548,177

GOVERNOR SYSTEM

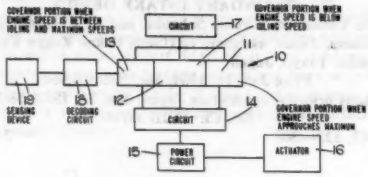
Christopher H. Best, Ashford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 1, 1983, Ser. No. 528,428

Claims priority, application United Kingdom, Feb. 8, 1980, 8004236

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **2 Claims**



1. An all speed governor system for the fuel pump of a road vehicle comprising first fuel pump control means for controlling the fuel pump according to a first fuel-engine speed relationship in an intermediate speed range and second fuel pump control means for controlling the fuel pump according to a second fuel-engine speed relationship in the intermediate speed range, said second fuel engine speed relationship being less sensitive to changes in engine speed then said first fuel-engine speed relationship whereby changes in fuel delivery to the fuel pump change engine speed according to said second fuel engine speed relationship less than those same changes in fuel delivery to the fuel pump will change engine speed according to said first fuel-engine speed relationship, and switching means for selecting either said first fuel pump control means or said second fuel pump control means according to whether an external load is connected to the road vehicle for changing the sensitivity of fuel-engine speed relationship for any given engine speed based on whether or not the road vehicle is hauling an external load whereby for any chosen engine speed said second fuel control means can be used when no external load is connected to the road vehicle to make the road vehicle easier to control than it would be if said first fuel pump control means were used, said switching means being operable independent of engine speed.

4,548,178

METHOD AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL-COMBUSTION ENGINE

Kunihiko Sato, and Hiroshi Takahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 22, 1983, Ser. No. 506,832

Claims priority, application Japan, Nov. 22, 1982, 57-203721

Int. Cl.⁴ F02D *5/02*

U.S. Cl. 123—478 **8 Claims**

1. A method for controlling the air-fuel ratio in an internal-combustion engine having a throttle valve in an intake-air passage thereof, comprising the steps of:

detecting a plurality of engine operating parameters including the rotational speed and coolant temperature of said engine;

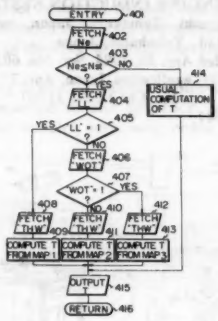
determining whether the detected rotational speed is higher than a predetermined value;

detecting the opening of said throttle valve;

computing a fuel-injection pulse duration depending upon only the coolant temperature and the opening of said throttle valve when the detected rotational speed is lower than or equal to said predetermined value;

computing a fuel-injection pulse duration depending upon said plurality of engine operating parameters when the

detected rotational speed is higher than said predetermined value; and



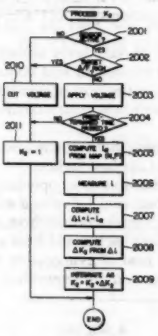
injecting the amount of fuel corresponding to said fuel-injection pulse duration into said engine.

4,548,179

AIR-FUEL RATIO CONTROL SYSTEM

Masakazu Ninomiya, Kariya, and Masaya Fujimoto, Ohbu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 21, 1984, Ser. No. 623,219
Claims priority, application Japan, Jun. 23, 1983, 58-113982
Int. Cl.[4] F02M *7/18*
U.S. Cl. 123—440 **9 Claims**



1. A system for controlling the air-fuel ratio of mixture gas supplied to an internal combustion engine, comprising:

an air-fuel ratio sensor, selectively applied with a predetermined bias voltage, for producing a characteristic saturation output current depending on concentration of oxygen contained in exhaust gas of said engine;

means, responsive to said output current, for controlling said air-fuel ratio of said mixture gas supplied to said engine; and

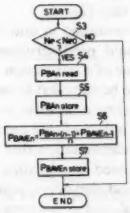
voltage regulation means for suspending function of said controlling means and reducing said bias voltage applied to said sensor when said controlling means determines that said engine requires a rich air-fuel ratio of said mixture gas.

4,548,180

METHOD FOR CONTROLLING THE OPERATING CONDITION OF AN INTERNAL COMBUSTION ENGINE

Akihiro Yamato, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,110
Claims priority, application Japan, Jun. 20, 1983, 58-110678
Int. Cl.[4] F02D *11/10, 1/04;* F02B *3/00*
U.S. Cl. 123—478 **5 Claims**



1. A method for determining the control amount of at least one parameter that is used to control the operating condition of an internal combustion engine, in which the operating condition of the engine is controlled in accordance with a detected value of vacuum level in an intake air passage, downstream of a throttle valve, comprising;

a first sampling step for sampling the vacuum level in the intake air passage of the engine at a first sampling timing synchronized with the rotation of the engine crankshaft;

a second sampling step for sampling the vacuum level in the intake air passage of the engine at a second sampling timing whose frequency is higher than the sampling timing of the first sampling step;

an averaging step for averaging a predetermined number of the sampled values of the vacuum level obtained by the second sampling step to generate an average value;

a selection step for selecting one of a sampled value obtained by the first sampling step and the said average value in response to at least one operating condition of the engine, and

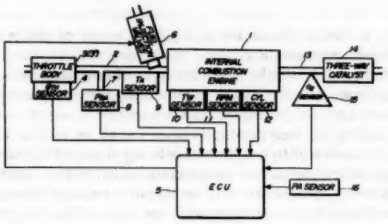
a control step for determining the control amount by a selected value obtained by the selecting step.

4,548,181

METHOD OF CONTROLLING THE FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AT ACCELERATION

Yoshikazu Ishikawa, Hiki, and Takeo Kiuchi, Asaka, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,387
Claims priority, application Japan, Jun. 22, 1983, 58-112297
Int. Cl.[4] F02M *51/00;* F02B *3/00*
U.S. Cl. 123—492 **10 Claims**



1. A control method of supplying an internal combustion engine with required quantities of fuel appropriate to operating

conditions of said engine, in synchronism with pulses of a control signal generated at predetermined crank angle positions of said engine, said method comprising the steps of:

(1) determining whether or not said engine is operating in a predetermined accelerating condition;

(2) detecting a value of a predetermined operating parameter of said engine indicative of the engine load, in synchronism with a predetermined sampling signal;

(3) determining a rate of change in th value of said predetermined operating parameter from values of the same detected in said step (2);

(4) when it is determined in said step (1) that said engine is operating in said predetermined accelerating condition, setting the value of a correction variable for increasing the fuel quantity to be supplied to said engine in said predetermined accelerating condition, to a value corresponding to the number of pulses of said control signal generated from the time said determination that said engine is operating in said predetermined accelerating condition is obtained for the first time, and also corresponding to the rate of change in the value of said predetermined operating parameter detected in said step (3), each time a pulse of said control signal is generated;

(5) applying the set value of said accelerating correction variable to setting of a quantity of fuel to be supplied to said engine in said predetermined accelerating condition; and

(6) supplying the set quantity of fuel to said engine in said predetermined accelerating condition.

4,548,182

TIMING DEVICE

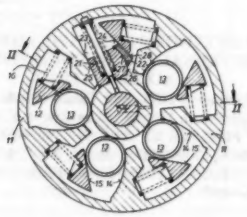
Ewald Kamleitner, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,797

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318024

Int. Cl.⁴ F02M *59/20*

U.S. Cl. 123—501 **6 Claims**



1. A timing device for an injection pump of piston driven internal combustion engines comprising two clutch parts, a plurality of flyweight means for transmitting the positive driving torque required by the pump during injection, and further means for transmitting at least a part of the negative torque occurring between injection operations by an oil film, each of said plurality of flyweight means being arranged between two respective slide surface means coordinated to the clutch parts and being operable to vary the angular position between the two clutch parts and therewith the start of fuel injection in dependence on the rotational speed, said further means generally counteracting lifting off of the plurality of flyweight means from respective slide surface means.

4,548,183

OPERATIONAL MODE RESPONSIVE HEATING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE INDUCTION SYSTEM

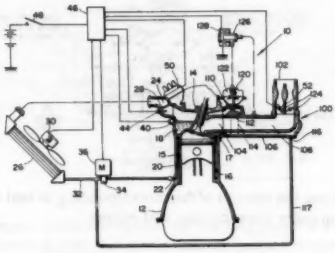
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1984, Ser. No. 602,448

Claims priority, application Japan, Apr. 27, 1983, 58-73001

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—547 **4 Claims**



1. In an internal combustion engine having (a) a coolant jacket into which coolant is introduced in a liquid state and discharged in a gaseous form and (b) an induction system including an induction conduit leading to a combustion chamber of the engine:

a radiator in fluid communication with said coolant jacket for receiving gaseous coolant therefrom and condensing same to its liquid state;

means for defining a heating jacket for heating said induction conduit, said heating jacket having an inlet port in fluid communication with said coolant jacket and an outlet port;

a level sensor for sensing the level of liquid coolant in said coolant jacket, said level sensor being located at a level above said combustion chamber and below that of said inlet port:

a pump responsive to said level sensor for returning the condensed liquid coolant to said coolant jacket via a return conduit, said outlet port of said heating jacket fluidly communicating with said return conduit upstream of said pump;

a valve for controlling fluid communication between said inlet port and said coolant jacket;

a control device responsive to an operating condition of said engine for operating said valve in a manner to open said valve and allow gaseous coolant from said coolant jacket to enter said heating jacket and heat said conduit by releasing the latent heat of evaporation thereof, when said engine is operating in a predetermined mode.

4,548,184

APPARATUS FOR THE LOAD-DEPENDENT ACTUATION OF AN ADJUSTING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Helmut Laufer, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,303

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135234

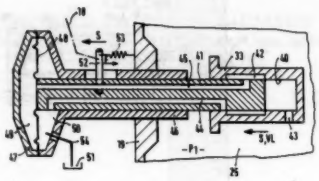
Int. Cl.⁴ F02M *39/00, 25/06*

U.S. Cl. 123—569 **2 Claims**

1. An apparatus for the load-dependent actuation of an exhaust gas recirculation (egr) quantity adjusting device of an internal combustion engine in combination with a fuel injection pump, said engine including an air intake tube, an exhaust gas tube and an exhaust recirculation line connecting said exhaust

gas tube to said intake tube, the fuel injection pump including a suction chamber adapted to be filled with pressurized fuel, a fuel quantity adjusting device, and a governor comprising a governor sleeve for actuation thereof, said governor sleeve being pressure-balanced and serves to control said egr quantity adjusting device of the internal combustion engine, the apparatus comprising:

a self-balancing hydraulic follower piston apparatus operationally connected to said governor and comprising a sheath within which a positioning piston is movably connected to actuate said egr quantity adjusting device, said governor sleeve being embodied as a movable part of a valve means of said follower piston apparatus controlling a pressure line which connects said suction chamber to a blind bore in said governor sleeve adjacent to a face of said positioning piston in which said positioning piston is provided with a control edge by means of which a connection from said blind bore to a relief line is controllable such that said positioning piston is biased by pressure in the blind bore in a direction which opens said connection to said relief line.



4,548,185

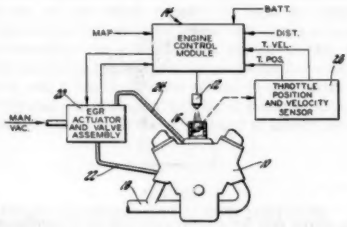
ENGINE CONTROL METHOD AND APPARATUS

Donald J. Pozniak, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 10, 1984, Ser. No. 649,119

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **3 Claims**



1. The method of controlling the value of an operating parameter of an engine as a function of at least one engine operating condition, the engine having an actuator responsive to a control signal for adjusting the operating parameter after a known delay time to a desired value, the method comprising the steps of:

determining the value of the engine operating condition;

determining the variation of the engine operating condition;

predicting the value of the engine operating condition at a future time based on the determined value and variation of the engine operating condition;

determining the desired value of the engine operating parameter corresponding to the predicted value of the engine operating condition;

determining the value of a control signal required to establish the desired value of the engine operating parameter;

providing the control signal at the determined value to the actuator at a time that precedes the future time by the known delay time, whereby the desired value of the engine operating parameter is established at the future time at which the corresponding predicted value of the engine operating condition was to occur.

4,548,186

METHOD AND DEVICE FOR PREHEATING AN ENGINE OR AN ENGINE INTAKE AIR

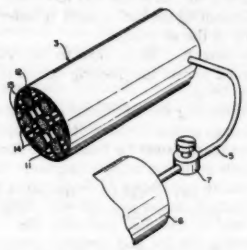
Katsuhiko Yamaji; Yasushi Nakata, both of Osaka; Shigeyuki Kawai, Takarazuka; Tatumi Hagihara, Hiroshima; Koji Kageyama, Hiroshima, and Yasushi Okazaki, Hiroshima, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed Sep. 5, 1984, Ser. No. 647,824

Claims priority, application Japan, Sep. 5, 1983, 58-163857; Sep. 5, 1983, 58-163858

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—556 **8 Claims**



1. An internal combustion engine intake air preheating device comprising:

an intake air preheater for preheating air to be fed into an engine, said preheater including a first metal hydride and being disposed within an intake air feeding tube for heat exchange with the intake air;

a hydrogen storage container including hydrogen at a predetermined pressure or a second metal hydride, said predetermined pressure being higher than, or said second metal hydride having a higher hydrogen dissociation pressure than, the hydrogen absorption pressure of said first metal hydride at the preheating temperature at the time of starting the engine, and said predetermined pressure being lower than or said second metal hydride having a hydrogen absorption pressure lower than the hydrogen dissociation pressure of said metal hydride at the temperature of the intake air during normal operation of the engine;

a pipe having a valve and connecting said intake air preheater to said hydrogen storage container for permitting hydrogen to move from said hydrogen storage container to said preheater when the preheater is at the preheating temperature and from said preheater to said storage container when said preheater is at said temperature of the intake air during normal operation of the engine.

4,548,187

INTERNAL COMBUSTION ENGINE FOR ALTERNATIVE FUELS

John Olsson; Bertil Olsson, and Gunnar Olsson, all of Partille, Sweden, assignors to J-Jet Konstruktions, Partille, Sweden

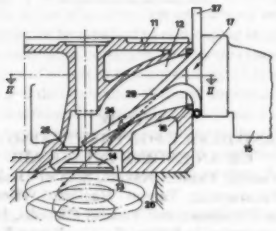
PCT No. PCT/SE82/00333, § 371 Date Jun. 15, 1983, § 102(e) Date Jun. 15, 1983, PCT Pub. No. WO83/01486, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 15, 1982, Ser. No. 513,118

Claims priority, application Sweden, Oct. 16, 1981, 8106113

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—557 **12 Claims**



1. In an internal combustion engine for alternative fuels and operated at the same compression ratio, wherein the fuel is fed to the cylinders through fuel feed lines and is preheated with heat from the exhaust system and an additional medium which is water or water in combination with other ingredients is fed to the cylinders, the improvement comprising:

a fuel feeding device in the fuel feed lines for proportioning and distributing the fuel to each cylinder in response to the air flow in the air intake;

means for detecting the air flow to the cylinders operatively connected to said fuel feeding device to control said fuel feeding device;

means for feeding the additional medium to each cylinder;

heat exchange means for each cylinder operatively arranged in the exhaust system for heating the fuel prior to entrance into each cylinder to a temperature between its flame temperature and above its evaporation temperature;

a fuel injection means in each inlet channel of the engine connected to the fuel line from the proportioning and distributing device and directed toward the respective inlet valve opening to inject fuel fed therethrough at a substantially flat, tangential angle with respect to the wall of the respective cylinder; and

a feeding nozzle for said additional medium in each inlet channel connected to said means for feeding the additional medium and directed toward the respective inlet valve opening to inject the additional medium therethrough inside the path of the fuel at a steeper angle with respect to the cylinder wall than said fuel injection.

4,548,188

LATERALLY ADJUSTABLE ARROW REST FOR AN ARCHERY BOW

Miroslav A. Simo, 370 N. Delaplaine Rd., Riverside, Ill. 60546

Filed Apr. 5, 1983, Ser. No. 482,186

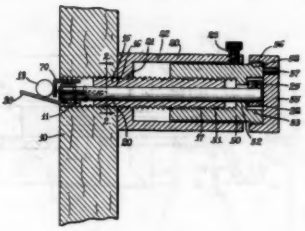
Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—41 A **33 Claims**

1. An arrow rest laterally adjustable with respect to a bow upon which it is mounted and having a pivotable arrow support arm which pivots forwardly upon release of an arrow and automatically returns to its initial position after discharge of an arrow comprising:

a receiving sleeve having a first portion fixedly attachable within a transverse through hole in a bow handle and an outer second portion sized to extend outwardly from said bow handle on the side away from said arrow in shooting position when fixedly attached in said through hole, said sleeve having a through opening;

an elongated mounting means adapted to fit non-rotatably and freely longitudinally movable within said sleeve through opening and having a first end extending from said receiving sleeve first portion and adapted to receive an arrow support means and having an opposite second end extending from said receiving sleeve second portion end of said sleeve through opening;



an arrow support means attached to said mounting means first end, said arrow support means comprising a pivotal arrow support arm and spring means capable of urging said arrow support arm to said initial position;

adjustment means engaging said second end of said mounting means and engaging said second portion of said receiving sleeve, movement of said adjustment means moving said mounting means longitudinally within said receiving sleeve.

4,548,189

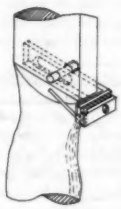
ARROW RESTS USED IN ARCHERY

Mitchell E. Pietraszek, 735 Saylor, Elmhurst, Ill. 60426, and Myron J. Rutledge, R.R. 3 Box 178, Oswego, Ill. 60543

Filed Sep. 21, 1982, Ser. No. 420,850

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—41 A **5 Claims**



1. An arrow rest for a bow, comprising in combination

a non-magnetic bracket member having first and second orthogonally disposed legs,

said first leg being apertured to receive means for attaching said bracket member to a bow,

a permanent magnet in the shape of a regular hexahedron,

means for mounting said magnet to said second leg of said bracket member,

an arrow rest pin formed of a magnetic material and having a straight intermediate portion,

a non-magnetic clamp member affixed to said second leg,

said clamp member having a rectilinear groove extending in a vertical direction when a bow is in a vertical position,

said intermediate portion of said rest pin being cylindrical and pivotably positioned in said groove,

said second leg extending across said groove to retain said pin in said groove,

said rest pin having an arrow rest portion adjacent one end of said intermediate portion and lying in a plane perpendicular to the longitudinal axis of said intermediate portion of said pin, and

said rest pin having a magnet engaging portion adjacent the other end of said intermediate portion,

said magnet engaging portion being straight and adapted to be juxtaposed with one face of said magnet when said rest pin is oriented with said rest portion lying in the horizontal plane while a bow is in the vertical plane.

4,548,190

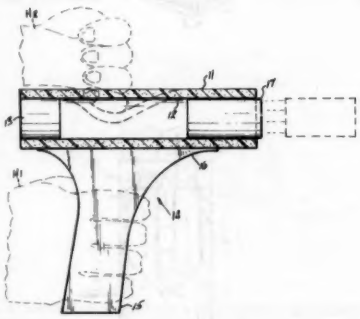
AIR PROPELLED PROJECTILE LAUNCHER

Theresa M. Megargee, 14 Milo Dr., Madison, Conn. 06443

Filed Jun. 7, 1983, Ser. No. 501,793

Int. Cl.⁴ F41B *11/00*

U.S. Cl. 124—56 **11 Claims**



1. A projectile launcher for launching a cylindrical projectile, comprising a tubular resilient barrel member defining a cylindrical bore having an internal peripheral wall and having front and rear ends, said tubular barrel member being of an extruded cellular material which will compress when sharply struck, a member attached to said barrel member at the rear end thereof and forming an essentially airtight seal with said barrel member, a cylindrical projectile having an outside diameter at least as large as the diameter of said bore insertable into the front end of said barrel member to form an essentially airtight seal therewith, whereby when said barrel member is struck intermediate the ends thereof, the air in said barrel member is compressed and expels the projectile from the front end thereof, and a handle member affixed to said barrel member whereby said gun is adapted to be held in one hand and said barrel member struck with the other hand to launch said projectile.

4,548,191

FOOD COOKING OVEN AND METHOD

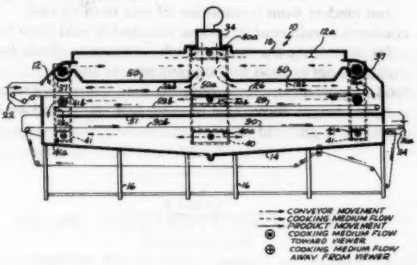
Yong Y. Hwang, Huron, Ohio, assignor to Stein Associates, Inc., Sandusky, Ohio

Filed Mar. 22, 1984, Ser. No. 592,030

Int. Cl.⁴ A21B *1/00*

U.S. Cl. 126—21 A **13 Claims**

1. An oven for cooking food products comprising an elongated housing having an inlet for food products to be cooked in said oven and an outlet for emitting cooked food products from said oven, heating means for heating a gaseous cooking medium in said housing for cooking food products therein, said housing being divided internally into vertically tiered longitudinally extending subchambers by generally horizontal baffle means, a plurality of vertically tiered conveyors for passing food products back and forth through said oven housing during the cooking process with the lowermost of said conveyors terminating generally adjacent said outlet and the uppermost of said conveyors commencing generally adjacent said inlet, said conveyors being generally permeable whereby cooking medium can pass therethrough, said conveyors being disposed in a respective one of said subchambers, said heating means being disposed generally centrally of said housing in a direction lengthwise thereof, and above said conveyors, duct means coacting with said heating means for causing application of the cooking medium to said conveyors, said duct means extending generally exteriorly of said housing and coacting with said heating means at the upper end of said duct means and with the interior of said housing at each of said subchambers for directing the cooking medium to the respective subchamber, and fan



means coacting with said housing and said subchambers at opposite ends thereof operable to cause division of the cooking medium applied to each said subchamber into two separate streams, one stream flowing in the direction of the respective conveyor product movement and the other stream flowing in a direction opposite to the direction of product movement of the respective conveyor, said fan means being operable to cause flow of the cooking medium in generally encompassing relation to the respective conveyor and then upwardly and back toward said generally centrally located heating means, whereat the cooking medium in both of said streams is reheatable for reuse in the cooking process.

4,548,192

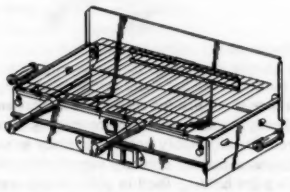
COLLAPSIBLE CAMP STOVE

Wen Y. Hsu, No. 6, La. 129, Fu-Kang St., Shin Lin District, Taipei, Taiwan

Filed Jul. 6, 1984, Ser. No. 628,493

Int. Cl.⁴ A47J *37/00*

U.S. Cl. 126—25 R **4 Claims**



1. A collapsible camp stove that folds into a self-contained substantially rectangular package, comprising:

a rectangular main body;

a front plate and a rear plate, each hinged along one of its sides to said main body and each having a hole of predetermined shape adjacent each of two opposite sides normal to said hinged side;

four fasteners, one of said fasteners being slidably retained within each of said holes in said front and rear plates respectively;

two side plates, each hinged along one of its sides to opposite

sides of said main body and each formed with end flanges each provided with a locking hole of predetermined shape to receive a portion of one of said fasteners when placed adjacent thereto, said fasteners and said locking holes being so positioned that when said side plates are moved to form corners with said front and rear plates, respectively, adjacent plates become connected when said fasteners are moved downwards and are subsequently disconnected when said fasteners are moved upward;

fuel support means for supporting burning fuel within and above the inside bottom surface of said main body;

base plate means, underneath said burning fuel and above the inside base surface of said main body, for receiving ash and cinders from combustion of said burning fuel;

combustion rate control means, attached to said main body, for controlling the rate at which combustion of said fuel is carried out on said fuel support means; and

food support means, for supporting food items at a predetermined height above said burning fuel, supported by said rear plate and said front plate.

4,548,193

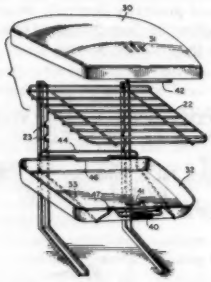
MULTI-PURPOSE PORTABLE OUTDOOR COOKING STAND

Emmanuel Marogil, 1293 N. La Fox, South Elgin, Ill. 60177

Filed Sep. 10, 1984, Ser. No. 648,524

Int. Cl.[4] F24B *3/00*

U.S. Cl. 126—30 **5 Claims**



1. An outdoor cooking stand assembly comprising in combination, a base structure for resting on the ground,

a vertically extending structure having mounting means therein for adjustably holding in place at various vertical locations a mating cooking utensil providing a cooking surface for holding food in place while cooking,

the vertically extending structure being adapted to interconnect with the base structure to support in stable condition food located on said cooking surface, and

a carrying case comprising a utensil pan shaped receptacle member for receiving therein all the parts of the cooking stand for storage and transport thereof in the carrying case with mating structure on the pan shaped receptacle member for mating with said mounting means in place on the vertically extending structure as a cooking implement wherein the carrying case comprises a vented hood member adapted to mate with said vertically extending structure above the cooking surface.

4,548,194

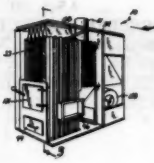
FUEL STOKER AND FURNACE

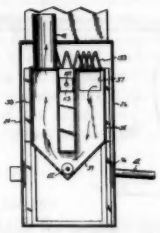
Tony L. Schafer; Stephen A. Schafer; Gregory L. Schafer, and H. Darwin Swett, all of Box 1382, Dickinson, N. Dak. 58601

Division of Ser. No. 402,325, Jul. 27, 1982, Pat. No. 4,430,948, which is a continuation-in-part of Ser. No. 309,245, Oct. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 240,213, Mar. 3, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,338

Int. Cl.[4] F23K *3/00*; F24H *3/02*

U.S. Cl. 126—110 R **3 Claims**





1. A furnace heat exchange assembly comprising:

a furnace cabinet having walls defining a furnace compartment;

a primary heat exchange unit located in the furnace compartment and defining a combustion chamber adapted to contain a burner assembly;

a second heat exchange unit positioned adjacent the primary heat exchange unit in the furnace compartment;

a first upper crossover conduit connecting the upper portion of the interior of the primary heat exchange unit and the upper portion of the interior of the second heat exchange unit;

a third heat exchange unit positioned adjacent the second heat exchange unit in the furnace compartment and positioned so that the second heat exchange unit and third heat exchange unit are in side-by-side relationship facing the primary heat exchange unit;

a first lower V-shaped crossover conduit connecting the lower portion of the interior of the second heat exchange unit to the lower portion of the interior of the third heat exchange unit along the length thereof in the direction facing the primary heat exchange unit;

a fourth heat exchange unit positioned adjacent to the third heat exchange unit opposite the primary heat exchange unit in the furnace compartment;

a second upper crossover conduit connecting the upper portion of the third heat exchange unit and the upper portion of the fourth heat exchange unit;

a fifth heat exchange unit positioned adjacent the fourth heat exchange unit in the furnace compartment and positioned so that the fourth and fifth heat exchange units are in side-by-side relationship facing the second and third heat exchange units;

a second lower V-shaped crossover conduit connecting the lower portion of the interior of the fourth heat exchange

unit to the lower portion of the interior of the fifth heat exchange unit along the length thereof in the direction facing the primary heat exchange unit; and

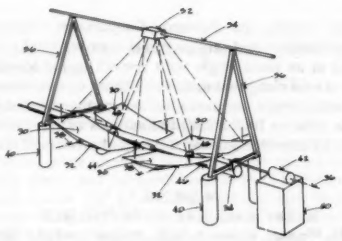
walls of said heat exchange units being spaced inwardly from the walls of the furnace cabinet and including air intake means to the furnace cabinet for intake of air to the furnace cabinet to be heated by circulation around said heat exchange units, and air exhaust means from the furnace cabinet to exhaust air having been heated on circulation around said heat exchange units.

4,548,195

SOLAR ENERGY APPARATUS WITH AUTOMATIC TRACKING ALIGNMENT ADJUSTMENTS

Alan C. Balhorn, 105 Hidden Meadow Rd., Apple Valley, Minn. 55124

Filed Dec. 27, 1983, Ser. No. 565,729
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—424 **8 Claims**



1. A method of controlling a solar energy apparatus of a type having an aspheric non-parabolic reflector for reflecting rays from the sun, the reflector having a focal axis; a fixed position receiver for receiving reflected sun rays from the reflector; and a tracking drive for moving the reflector; the method comprising:

determining a half-angle position of the reflector in which the focal axis is aligned generally with a half angle between the sun and the receiver;

determining a skew factor which is a function of an angle between the sun and a vertical axis to offset effects of tracking alignment errors resulting from location of a pivot axis of the reflector;

determining a modified position of the reflector based upon the half-angle position and the skew factor; and

controlling the tracking drive to move the reflector to the modified position so as to maintain the focal axis aligned generally with the half angle between the sun and the receiver but with the alignment of the focal axis with the half angle being skewed by the skew factor which is a function of an angle between the sun and a vertical axis.

4,548,196

SOLAR COLLECTOR COMPRISING TRANSPARENT HOLLOW PLASTIC MICROSPHERES AS INSULATION MATERIAL

Leonard B. Torobin, Materials Technology Corp., P.O. Box 6844, Bellevue, Wash. 98007

Continuation of Ser. No. 103,113, Dec. 13, 1979, abandoned, which is a division of Ser. No. 59,296, Jul. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 937,123, Aug. 28, 1978, abandoned, and a continuation-in-part of Ser. No. 944,643, Sep. 21, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 428,923
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—443 **30 Claims**

1. A solar energy collector comprising an outer transparent cover and an inner cover, and having disposed there-between a black coated heat absorber and at least one heat exchange medium tube, wherein said outer cover consists of a transparent sheet comprising a mass of hollow plastic microspheres or a transparent panel comprising a mass of hollow plastic microspheres, wherein the microspheres in said sheet or panel are cemented together by fusion or sintering or bonded together with an organic or inorganic bonding agent or adhesive, said

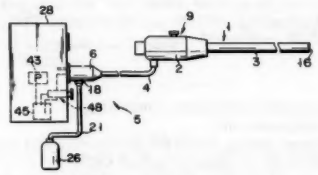
microspheres being of substantially uniform diameter of 500 to 6,000 microns and of substantially uniform wall thickness of 0.5 to 400 microns and said microspheres are free of latent solid or liquid blowing gas materials or gases and the walls of said microspheres are substantially free of holes, relatively thinned wall portions or sections and bubbles.

4,548,197

AIR AND LIQUID SUPPLYING DEVICE FOR ENDOSCOPE

Kunio Kinoshita, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,999
Claims priority, application Japan, Mar. 22, 1983, 58-47732; Mar. 31, 1983, 58-56189; Mar. 31, 1983, 58-56192
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **14 Claims**



1. An air and liquid supplying device for an endoscope which includes a control section, an insertion section extending from the control section, and an air supply channel and a liquid supply channel extending from the control section to the distal end of the insertion section, said device comprising:

a main body with a connecting portion;

an air pump arranged in the main body;

a first liquid supply tank holding a first liquid therein;

first switching means connected to the air supply channel and the liquid supply channel;

communicating means having one end connected to the control section and the other end detachably connected to the connecting portion;

connecting means having a first air feed path which has one end connected to the first switching means and the other end opening to the other end of the communicating means and which extends inside the communicating means, a second air feed path connecting the air pump and the connecting portion, a compressed air path branching from the first air feed path and communicating with the first liquid supply tank, and a liquid feed path connecting the first liquid supply tank and the first switching means;

said first switching means being switchable between a first position at which the switching means communicates the first air feed path with the air supply channel to allow the supply of air from the air pump to the air supply channel and a second position at which the switching means com-

municates the liquid feed path with the liquid supply channel to allow the supply of the first liquid to the liquid supply channel;

a second liquid supply tank holding a second liquid therein and connected to the second air feed path;

second switching means, connected to the second air feed path at a position intermediate between the second liquid supply tank and the connecting portion, for switching between the supply of air and the supply of the second liquid to the second air feed path; and

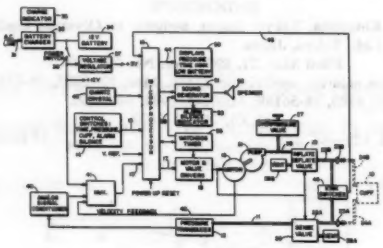
leakage preventive means for communicating the first and second air feed paths when the other end of the communicating means is connected to the connecting portion and for preventing leakage of at least the second liquid through the second air feed path when the other end of the communicating means is not connected to the connecting portion.

4,548,198

AUTOMATIC TOURNIQUET

Michael R. Manes, Littleton, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.

Filed Apr. 15, 1983, Ser. No. 485,546
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—327 **9 Claims**



1. A pneumatic tourniquet comprising:

(a) an inflatable cuff;

(b) pressure sensing means for producing a first signal representative of the pressure in said cuff;

(c) means for producing a second signal representative of a selected pressure;

(d) means responsive to said first and second signals for determing a pressure adjustment related to the selected pressure and the sensed pressure, said means for determining further including a means for varying said pressure adjustment dependent on the magnitude of the difference between said selected pressure and said sensing pressure, and for providing a third signal representative of said pressure adjustment; and

(e) means responsive to said third signal for adjusting the pressure in said cuff.

4,548,199

FRACTURE SPLINT

John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822

Continuation of Ser. No. 321,150, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 218,893, Dec. 23, 1980, abandoned, which is a continuation of Ser. No. 969,976, Dec. 15, 1978, abandoned. This application Nov. 23, 1983, Ser. No. 555,104
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 A **1 Claim**

1. A splint for setting fractures of the radius, said splint comprising:

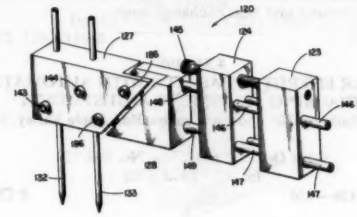
a distal member;

first means for securing said distal member to a metacarpal bone on the distal side of the radius fracture;

a proximal member having a stationary component, a movable component, and a pivot pin pivotally joining the movable component to said stationary component;

second means for securing the stationary component of said proximal member to the radius on the proximal side of the radius fracture; and

elongated means for joining said distal member to said proximal member, said joining means including means for selectively varying the distance of separation between said distal member and said proximal member, said pivot pin being at an acute angle with respect to the longitudinal axis of said elongated means and being coextensive with a line extending from the radius side of the arm at an acute angle relative to the longitudinal axis of the radius to a point of intersection near the styloid process of the ulna.



4,548,200

ENDOTRACHEAL TUBE HOLDER

Herbert H. Wapner, Belmont, N.H., assignor to Baka Manufacturing Company, Inc., Plainville, Mass.

Filed Apr. 18, 1983, Ser. No. 485,843
Int. Cl.⁴ A61M *25/02*
U.S. Cl. 128—207.17 **8 Claims**

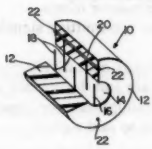
1. An endotracheal tube holder for securing an endotracheal tube when the latter is disposed in the mouth of a patient comprising a first strip of Velcro-type fastening material having a pressure sensitive adhesive on one side surface adapted to be adhered about the circumference of the endotracheal tube on the portion of the tube disposed outside the mouth of the patient, said strip having hook-like fasteners on its reverse side surface which are exposed when the strip is adhered to the tube,

a band of soft looped fabric material having two free end portions and an elongated intermediate portion therebetween, said intermediate portion being adapted to be wound about the first strip on the tube such that the hook-like fasteners releasably engage the soft looped fabric, said end portions adapted to extend around the head of the patient and overlap each other and the band,

and additional short strips of Velcro-type material attached to each end portion of the band, respectively, and having

hook-like fasteners adapted to secure the end portions of the band to the intermediate portion of the band behind the head of the patient.

4,548,201
ELASTIC LIGATING RING CLIP
Inbae Yoon, 2213 Forest Ridge Rd., Timonium, Md. 21093
Filed Apr. 20, 1982, Ser. No. 370,170
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—326 **43 Claims**



1. A band for surgically ligating an anatomical organ structure, comprising:

means made of an elastic material and having an expansible lumen, for compressing a loop of an anatomical organ structure drawn into said lumen; and

means joined to said compressing means proximate to said lumen, being arranged with respect to the interior wall of said lumen and oriented towards the longitudinal axis of said lumen for protruding through said loop without penetrating the wall tissue of the organ structure forming said loop and thereby obstructing passage of said anatomical organ structure through said lumen when said compressing means is released to return to said relaxed state around said loop, said compressing means and said protruding means being selected to compress and occlude the anatomical organ structure drawn into said lumen.

21. A kit for preparing a ring applicator device to apply one or more elastic rings, comprising:

one or more solid elastic rings of a non-tissue reactive material, each ring providing a passageway therethrough and having one or more elements radially protruding from not more than two diametrically opposed directions effectively dividing said passageway into two adjoining sections and obstructing said passageway when said ring is released to return to a relaxed state;

a ring loader having an elongated distal end insertable through said passageway extending from the apex of a cone having a base fitted to join the distal end of a ring applicator device and one or more channels extending from said distal end to said base for accommodating said radially protruding elements; and

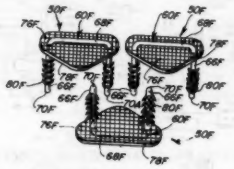
means having a plurality of joined, deformable segments providing a plurality of bearing surfaces defining a central aperture insertable around said elongated distal end and expandible about said cone, for dilating one of said rings by distributing force over an equal plurality of areas on a surface of one of said rings whereby one or more of said rings are advanced from said elongated member, expanded over said cone and positioned on the distal end of said ring applicator device.

4,548,202
MESH TISSUE FASTENERS
Robert B. Duncan, Bridgewater, N.J., assignor to Ethicon, Inc., Somerville, N.J.
Filed Jun. 20, 1983, Ser. No. 506,142
Int. Cl.⁴ A61B *17/04*
U.S. Cl. 128—334 C **2 Claims**

1. A fastener adapted to hold together, in conjunction with one or more other similar fasteners, two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

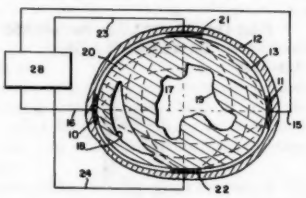
a fastening member with at least two spaced-apart legs each having a distal end adapted to pass through the tissue portions, each said leg defining on its exterior along at least a portion of its length a plurality of barbs angled rearwardly away from the leg distal end; and

a mesh of flexible filaments, said mesh having a generally triangular configuration, said mesh extending between adjacent legs and said mesh extending outwardly from, and generally normal to, each of said legs to define a leg receiving area whereby the legs of one of the fastening



members may be passed through the tissue portions from one side of said wound or incision with the mesh being disposed against one of said tissue portions and whereby the legs of another of the fastening members may be inserted through the tissue portions from the other side of said wound or incision with the mesh of said other fastening member lying substantially against the other of said tissue portions so that at least one leg of each of said fastening members penetrates the mesh of the other fastening member with the leg barbs engaging both the mesh and the adjacent tissue portions so as to inhibit relative movement of said fastening members at least in the disengaging directions.

4,548,203
SEQUENTIAL-PULSE, MULTIPLE PATHWAY DEFIBRILLATION METHOD
Willis A. Tacker, Jr.; Joe D. Bourland; Charles F. Babbs, and Leslie A. Geddes, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.
Continuation-in-part of Ser. No. 383,781, Jun. 1, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 624,269
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 D **6 Claims**



1. A method for controlling ventricular fibrillation or tachycardia which comprises implanting one pair of electrode laterally and another pair of electrodes ventrally-dorsally and subjecting each of said pairs of electrodes in sequence to an electrical pulse at a voltage between about 80 and about 450 volts for a time between about 1 and about 5 milliseconds, the pulses being separated by an interval of about 0.1 millisecond to about 2 milliseconds.

4,548,204

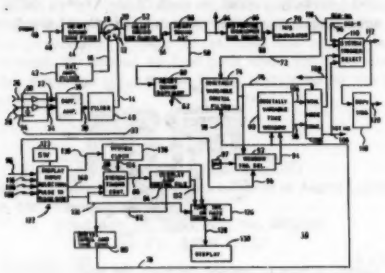
APPARATUS FOR MONITORING CARDIAC ACTIVITY VIA ECG AND HEART SOUND SIGNALS

Mark W. Groch, Elk Grove, and James R. Domnanovich, Roselle, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Division of Ser. No. 241,388, Mar. 6, 1981, Pat. No. 4,496,873. This application Feb. 23, 1984, Ser. No. 583,086

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—700 **6 Claims**



1. In apparatus for detecting heart sounds and analyzing ECG signals, the apparatus including a heart sound signal input and an ECG signal input, the combination of:

first means responsive to said ECG signal for modulating said ECG signal with a predetermined audio frequency to provide a modulated ECG signal;

second means responsive to said modulated ECG signal and said heart sound signal input for combining said signals as a combined modulated ECG signal and heart sound signal output as a single combined signal; and

receiving means responsive to said single combined signal for providing an ECG signal output and a heart sound signal output, said receiving means comprising third means for demodulating said single combined signal in accordance with said predetermined audio frequency to provide said ECG signal and fourth means for providing said heart sound signal, and fourth means comprising filtering means for passing low frequency signals associated with heart sounds and attenuating high frequency signals not associated with heart sounds.

4,548,205

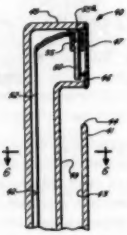
OPHTHALMIC INSTRUMENT FOR MEASURING INTRAOCULAR FLUID PRESSURE

C. D. Armeniades, 2127 Addison Rd., Houston, Tex. 77030, and Louise C. Moorhead, 3803 University Blvd., Houston, Tex. 77005

Filed Oct. 27, 1982, Ser. No. 436,953

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—748 **18 Claims**



1. An ophthalmic device for measuring relative pressure of fluid inside an ocular globe, the device being of the type adapted to cooperate with a fluid transfer means which is located external of the ocular globe and capable of supplying or removing intraocular fluid in response to predetermined signals, the device comprising:

(a) an elongated surgical instrument adapted to penetrate the ocular globe;

(b) pressure sensitive means mounted on the instrument for moving in response to relative pressure changes in intraocular fluid;

(c) transducer means communicating with the pressure sensitive means for generating signals in response to movement of the pressure sensitive means;

(d) signal means for transmitting signals to the fluid transfer means; and

(e) first conduit means operatively connected between the fluid transfer means and the interior of the ocular globe so that fluid can be supplied to or removed from the ocular globe in response to said signals.

4,548,206

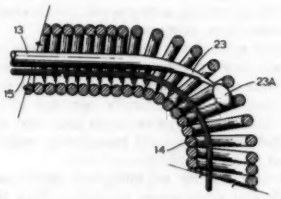
CATHETER WIRE GUIDE WITH MOVABLE MANDRIL

Thomas A. Osborne, Bloomington, Ind., assignor to Cook, Incorporated, Bloomington, Ind.

Filed Jul. 21, 1983, Ser. No. 515,636

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—772 **5 Claims**



1. A wire guide having a flexible distal tip and adapted for guiding a catheter within a body blood vessel, comprising:

a helically wound wire including coils defining a longitudinal opening;

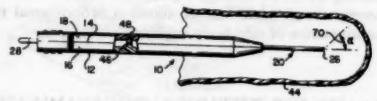
a mandril including distal and proximal ends and having a distal portion and a proximal portion, said mandril being slidably received within said longitudinal opening of said wire, whereby said distal end of said mandril is longitudinally movable therein relative to said wire for varying the flexibility of said distal tip of said wire guide, said distal portion being tapered inwardly towards the distal end of said mandril thereby causing said wire guide flexibility to progressively increase along said taper, said mandril further including an enlarged bulb at said distal end, whereby said bulb permits said mandril to be advanced relative to the longitudinal opening of said helically wound wire with the flexible distal tip of said wire guide flexed without said mandril protruding through the coils of said helically wound wire; and,

a means, including a coating of lubricating material, for facilitating smooth movement of said mandril within said opening of said helically wound wire.

4,548,207
DISPOSABLE COAGULATOR

Harry G. Reimels, Braintree, Mass., assignor to Mentor O & O, Inc., Hingham, Mass.

Filed Nov. 17, 1982, Ser. No. 442,261
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.17 4 Claims

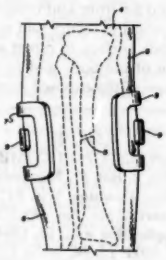


1. A disposable coagulator comprising:
(a) a housing formed of an insulating material;
(b) a coaxial probe defining an inner electrode and an outer electrode and having a beveled end and secured within said housing, with said beveled end extending therefrom at one end of said housing;
(c) a pair of contact pins also secured within said housing but extending therefrom at its other end;
(d) a pair of wires connecting said inner and outer electrodes of said coaxial probe to said pair of contact pins;
(e) a wrapper containing said housing, said coaxial probe, said pair of contact pins, and said pair of wires in sterilized condition;
(f) said housing being formed, along its axial length, of two parts snap-fit to one another so as firmly to hold said coaxial probe therebetween, said two parts being injection formed of a plastic material and provided with complementary mating members snap-fit to each other so as to secure said two parts of said housing to one another along its said axial length; and
(g) an adhesive layer applied to at least one of said parts in the vicinity surrounding said coaxial probe, said adhesive layer cooperating with said two parts to firmly hold said coaxial probe in place.

4,548,208
AUTOMATIC ADJUSTING INDUCTION COIL TREATMENT DEVICE

Bill H. Niemi, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 27, 1984, Ser. No. 624,871
Int. Cl.[4] A61N *1/40*
U.S. Cl. 128—419 F 9 Claims

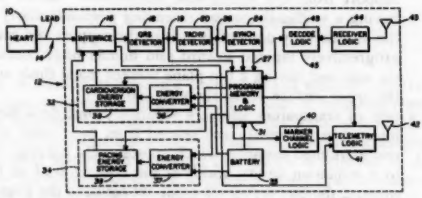


1. A medical device for inducing electrical current within a patient's body by creating a magnetic field through the body comprising:
first coil for placement in a treatment relation to a patient's body;
second coil for placement in a second treatment in relation to the patient's body so that the first coil and second coil are in a generally flux-aiding relation to each other;
driver circuitry for providing pulsed electrical energy to the first and second coils;
control means operably connected to the driver circuitry for controlling the magnitude of the electrical energy;
multiplexer means connected to the first coil and second coil and operably connected to the control means for selecting one coil; and
the control means including means for indicating to the multiplexer means that one of the coils is selected for driving by the coil driver and the other of the coils is selected for sensing magnetic field induced by the other coil, and for automatically adjusting the magnitude of electrical energy produced by the driver circuitry based upon sensed magnetic field.

4,548,209
ENERGY CONVERTER FOR IMPLANTABLE CARDIOVERTER

Pierre G. E. Wielders, Nieustadt, and Robert Leinders, Sittard, both of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 6, 1984, Ser. No. 577,635
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D 6 Claims



1. An implantable medical device for the electrical termination of an arrhythmic condition of the heart comprising:
means responsive to cardiac depolarizations for producing sense signals indicative of natural cardiac activity;
detection means responsive to said sense signals for detecting a cardiac arrhythmia and for producing an arrhythmia signal indicative of such arrhythmia;
logic means for providing a trigger signal in response to an arrhythmia signal;
power source means for providing voltage and current at a first level to said medical device;
means for providing clock signals at predetermined clock intervals; and
cardioversion energy pulse generator means for delivering a cardioverting pulse to cardiac tissue in response to said trigger signal further comprising cardioversion energy conversion means for generating cardioversion energy including:
cardioversion energy storage means for storing voltage and current at a second level higher than said first level;
current transforming means responsive to said power source means and said clock signals for providing charging current to said cardioversion energy storage means during a portion of each clock interval; and
regulating means responsive to the current drawn from said power source means by said current transforming means for establishing the length of said portion of each clock interval that said power source means is coupled to said current transforming means.

4,548,210

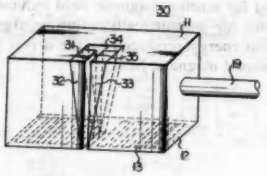
PROBE FOR ULTRASONIC-ECHO PLANIGRAPHIC IMAGING APPARATUS

Susumu Eajoji, and Koji Saito, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 10,596, Feb. 7, 1979, abandoned. This application Aug. 5, 1981, Ser. No. 290,401

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660 **3 Claims**



1. A probe for an ultrasonic-echo planigraphic imaging apparatus, comprising

a support having a bottom wall adapted to be brought into contact with a human body,

a plurality of transducer elements provided on said bottom wall and arranged at least in one row lengthwise of the support,

said support having a cavity extending partly across the support from one lengthwise lateral wall thereof and having a wedge-shape and extending perpendicularly to the human body-contacting side of the support and being progressively tapered toward said human body-contacting side and having a top plane thereof made flush with the upper surface of the support, and

a pair of transparent adapters separately and detachably inserted in the cavity and spaced from each other at a predetermined distance which substantially corresponds to a minimum cavity width at the bottom wall of the support, thereby defining a guide slit between the aligned lateral walls of the adapters and the inner wall of the support facing said lateral walls, and a guide groove between the mutually facing walls of the adapters to jointly constitute an opening for oblique insertion of a puncturing cannula, and for removal of the probe from the puncturing cannula while leaving the puncturing cannula pierced obliquely in the body.

4,548,211

COMPUTER ASSISTED ADMITTANCE PLETHYSMOGRAPH

Lloyd A. Marks, 21 Bridge Rd., Setauket, N.Y. 11733

Filed Jan. 12, 1984, Ser. No. 570,079

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—694 **28 Claims**

1. A method of measuring the conductance and conductance changes in a body segment, comprising the steps of:

applying an alternating current signal to said body segment;

measuring the resulting voltage signal across said body segment caused by the application of said alternating current signal;

producing a first signal corresponding to the magnitude of the alternating current signal and a second signal corresponding to the magnitude of the resulting voltage signal; and

dividing said second signal by said first signal thereby producing a divided voltage signal,

whereby the divided voltage signal is proportional to the conductance of said body segment.

4,548,212

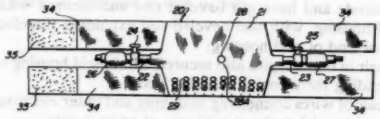
APPARATUS FOR THERMOGRAPHIC EXAMINATIONS

Frank K. Leung, 228 E. Winchester Rd., Libertyville, Ill. 60048

Filed Oct. 29, 1982, Ser. No. 437,697

Int. Cl.⁴ A61B *10/00;* **A61F** *7/00*

U.S. Cl. 128—736 **7 Claims**



1. An apparatus for thermally controlling local body temperature for use in conjunction with a source of air of a predetermined temperature; and a blower means in communication with said source for circulating said air of a predetermined temperature comprising:

an input line means for communicating with said air source and blower means for receiving air;

an air tent including a cover and sealing means, said cover having edge surfaces adapted to substantially conform to the shape of a localized portion of the body and having a first opening therein which exposes the portion of the body to be thermally controlled, said sealing means disposed around said edge surfaces to seal said cover in a substantially airtight manner against a body surface and defining a chamber between said body surface and said cover, said cover further having a second opening in an overlying position with said first opening, with said second opening adapted to receive the lens of a camera to photograph said exposed portion of the body, and with said chamber in communication with said input line means to receive air of a predetermined temperature;

an output line means in communication with said chamber for receiving said air from said chamber; and

air tent securing means to secure said air tent in close proximity to said body surface to direct air directly onto the exposed portion of the body and to thereby control the body temperature of the exposed portion of the body.

4,548,213

CORN UNIT FOR COMBINE

James E. Phillips, Rte. 7, Box 27, Menomonie, Wis. 54751, and Jerome J. Cassellius, Downing, Wis. 54734

Continuation-in-part of Ser. No. 489,375, Apr. 28, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 639,940

Int. Cl.⁴ A01F *12/44;* **B07B** *1/04, 1/46*

U.S. Cl. 130—24 **5 Claims**

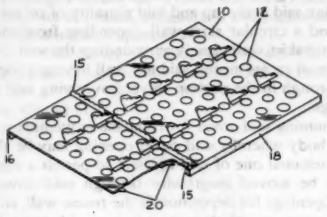
1. An element for separating corn cobs from corn plant debris designed to serve as a replacement for the chaffer unit of a combine comprising

A. a flat rigid surface having numerous perforations approximately 1-¼ and 2-½ inches in diameter therethrough,

B. said perforations being arranged in staggered relationship to each other and being of a size sufficient to allow passage of broken corn cobs and corn kernels therethrough,

C. a supporting structure for said surface including side

frame members and transverse ribs attached to at least one surface thereof, and



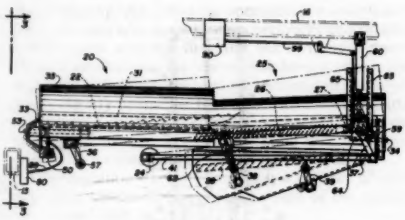
D. longitudinally aligned fins protruding from the upper surface thereof and being positioned between rows of said perforations.

4,548,214

FORE-AND-AFT LEVELING MECHANISM FOR COMBINE CLEANING APPARATUS

Ronald T. Sheehan, and Myles Hyman, both of Lancaster, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Oct. 11, 1984, Ser. No. 659,933
Int. Cl.⁴ A01F *12/30*
U.S. Cl. 130—27 AE **12 Claims**



1. In a combine harvester having a mobile main frame; threshing and separating means supported by said main frame to thresh crop material fed thereto and to separate threshed grain from trash residue, said threshing and separating means being operable to convey threshed grain for further harvesting treatment and to discharge the crop residue along a path separate from said threshed grain; cleaning means supported by said main frame in flow communication with said threshing and separating means to receive threshed grain therefrom and clean debris from said threshed grain, said cleaning means having first sieve means operable to permit the passage of cleaned grain therethrough, a fan operable to blow air through said first sieve means to facilitate the removal of debris from said threshed grain, a grain pan positioned to receive threshed grain from said threshing and separating means, and conveying means to convey said threshed grain from said grain pan to said first sieve means; and drive means for powering the operation of said threshing and separating means and said cleaning means, the improvement comprising:

a shaker shoe having first and second longitudinally spaced ends and mounting said grain pan and said first sieve means for movement in a generally fore-and-aft direction, said shaker shoe being pivotally supported at one of said ends by said main frame about a transversely extending pivot axis, the other said end being generally vertically movable about said pivot axis;

a second sieve means positioned below said first sieve means to receive cleaned grain therefrom and subject said cleaned grain to further cleaning action, said second sieve means being mounted for a generally fore-and-aft movement in opposition to the movement of said first sieve means by two sets of connecting links, one of said sets of connecting links being connected to said shaker shoe on the opposing side of the pivotal connection to said main frame to drive said second sieve means in the opposing direction to said shaker shoe; and

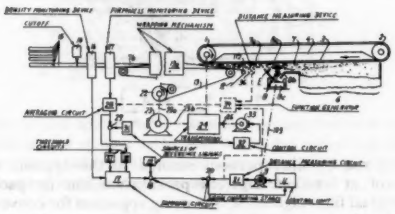
an actuator interconnecting said main frame and said other end of said shaker shoe to effect a selective movement of said other shaker shoe end about said pivot axis.

4,548,215

METHOD AND MACHINE FOR MAKING CONTINUOUS CIGARETTE RODS AND THE LIKE

Klaus Adebahr, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 528,961
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232777
Int. Cl.⁴ A24C *5/18*
U.S. Cl. 131—84.4 **25 Claims**



1. A method of making a continuous rod wherein a web of wrapping material confines a rod-like filler of smokable material, particularly tobacco, comprising the steps of forming a continuous stream consisting of smokable material and containing such material in excess of that which is required in the filler; advancing the stream lengthwise along a predetermined path at a first speed; converting the advancing stream into a filler including removing the excess therefrom; introducing the web of wrapping material into and advancing the web lengthwise along said path at a lesser second speed; draping the advancing web around the advancing filler with attendant formation of said rod; decelerating the filler from said first to said second speed prior to completion of said draping step with attendant condensation of successive increments of the filler; monitoring the density of successive increments of the filler; and adjusting said removing step as a function of changes of monitored density of the filler.

4,548,216

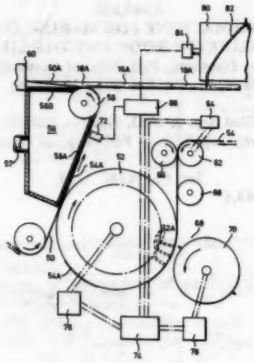
CIGARETTE MANUFACTURE

Ronald A. Ahern, High Wycombe, England, assignor to Molins Limited, London, England

Continuation-in-part of Ser. No. 248,447, Mar. 27, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,178
Int. Cl.⁴ A24C *5/47, 5/52*
U.S. Cl. 131—94 **7 Claims**

1. Apparatus for making and packing filter cigarettes comprising a rod-making machine including means for forming a continuous tobacco-filled rod, means for cutting the rod at regular intervals to form double-length tobacco rods, means for spacing the tobacco rods apart while they are moving longitudinally, means for inserting double-length filter portions between successive rods, means for cutting from a continuous web of uniting material strips each having a length adapted for extending along the entire length of a double-filter portion and overlapping the adjacent ends of the adjacent tobacco rods, means for feeding the strips at spaced intervals onto the filter portions and tobacco rods, means for detecting the positions of

the strips, means responsive to the detector for controlling the said feed means for maintaining correct delivery of the strips onto the filter portions and tobacco rods, means for wrapping the strips around the tobacco rods and filter portions to form a continuous rod comprising alternate double tobacco and filter portions, and means for cutting the continuous rod through the middle of each double-filter portion to form double-cigarette units wherein the tobacco is sealed in each double-length to-



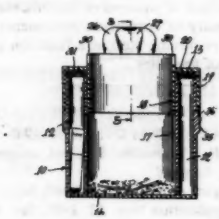
bacco rod by filter portions secured to the opposite ends thereof; at least one cigarette packing machine for packing individual filter cigarettes; conveying apparatus for conveying the double-cigarette units from the rod-making machine to the packing machine and including or having associated therewith a cigarette storage apparatus; and cutting means located at the packing machine for cutting the double-cigarette units through the middle to form individual filter cigarettes prior to the packing thereof by the packing machine.

4,548,217

COMBINED CIGARETTE EXTINGUISHER AND ASH TRAY

Frank W. Saculla, 3447 Glenmere Dr., Youngstown, Ohio 44511

Filed Jan. 28, 1983, Ser. No. 461,688
Int. Cl.⁴ A24F *19/14*
U.S. Cl. 131—235.1 **10 Claims**



1. A cigarette butt receiver, comprising a cylindrical body of rigid material, adapted to have its bottom resting on a table top and the like to support said body with its longitudinal axis upright,

said body having means defining a plurality of individual elongated parallel recesses spaced apart along a circle adjacent to and outwardly of its cylindrical periphery, each recess means providing a well to receive and enclose a cigarette butt disposed lengthwise therein and each well being of a transverse size to comfortably receive a lengthwise disposed cigarette butt,

each of said wells being closed at said body bottom and each having an upwardly facing opening at the top of said body,

a cover having an annular trasversely-disposed top wall overlying said body top and said plurality of recess openings, and a circular skirt wall depending from said top wall, said skirt wall closely surrounding the said circular plurality of recess means, said top wall having an opening therethrough in the portion thereof overlying said recess openings,

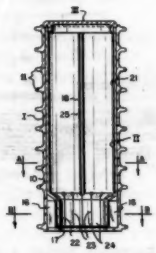
means mounting said cover for rotatable movement relative to said body whereby said cover opening may be aligned with a selected one of said recesses to permit a cigarette butt to be moved lengthwise through said cover and recess openings for deposition in the recess well, rotation of said cover to misalign its opening with the selected recess well containing the cigarette butt causing restriction of air supply to such recess well by said top wall to cause early extinguishment of the lighted end of such butt.

4,548,218

HAIR CURLING ROLLER

Dov Z. Glucksman, 26 Beacon St., Apt. 9F, Burlington, Mass. 01803

Filed Dec. 30, 1983, Ser. No. 567,238
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.⁴ A45D *2/02*
U.S. Cl. 132—39 **20 Claims**



1. A hair curler roller having a top and a bottom end, adapted to be heated while its bottom end is seated on one of a plurality of identical frusto-conical, heated posts of a heating unit, said roller constisting of: a cylindrical shell of a substantially cylindrical, smooth inner surface provided on its outside with hair-gripping means; said shell being of a synthetic resin; and of a generally cylindrical sleeve of metal of high heat conductivity positioned inside said shell, said sleeve comprising a top portion of cylindrical configuration closely adhering to the inner surface of said shell, and a neck portion of smaller diameter adapted to fit onto said frusto-conical post of said heating unit, said neck portion being provided with slots arranged in such a manner that said neck portion is free to expand outwardly so as to closely adhere to the surface of said post.

4,548,219

FLUORIDE-COATED DENTAL FLOSS

Michael G. Newman, 809 Alma Real Dr., Pacific Palisades, Calif. 90272, and Fermin A. Carranza, Jr., 10577 Eastborne Ave., Los Angeles, Calif. 90024

Filed Mar. 14, 1983, Ser. No. 475,234
Int. Cl.⁴ A61C *15/00*
U.S. Cl. 132—91 **7 Claims**

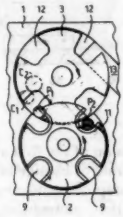
1. A process of manufacturing fluoride-coated dental floss comprising: dissolving a fluroide composition in water, adding the mixture to melted water-soluble wax, and applying the mixture to dental floss.

4,548,220

DEVICE FOR CHECKING METAL PIECES, MORE PARTICULARLY COINS

Son Le Hong, Villebon sur Yvette, and Henri Martin, Chatel Guyon, both of France, assignors to Compagnie de Signaux et d'Enterprises Electriques, France

Filed May 17, 1983, Ser. No. 495,158
Claims priority, application France, Mar. 9, 1983, 83 03897
Int. Cl.[4] G07D 3/00
U.S. Cl. 133—3 H **12 Claims**



1. A device for sorting and checking metal pieces such as coins, comprising:

a first sloping rotary disk for operation as a separation disk, onto which the coins are to be thrown in mixed types and random orientations and which is provided at its periphery with pockets, each pocket adapted to receive one and only one coin;

a second sloping rotary disk for operation as a detection disk, also provided with pockets at its periphery and rotating in synchronism with the first disk but in reverse direction about a parallel axis, the second disk having an axis placed higher than the first disk, and the second disk occupying a plane slightly below the first disk with the disks partially overlapping, whereby a coin in a pocket of the first disk is transferred to a pocket of the second disk by action of gravity at a culminating point of its travel; and,

a coin recognition device comprising a number of electromagnetic sensors disposed along a path of the pockets of the second disk.

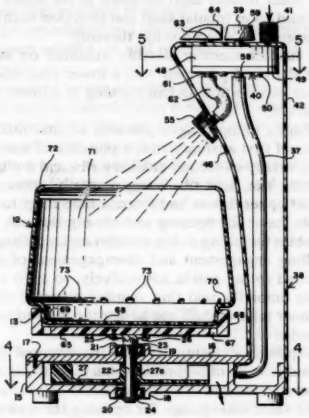
4,548,221

FOOD PRODUCTS WASHING AND DRYING MACHINE

Stanton Abrams, Los Angeles, Calif., assignor to Shelley Manufacturing Company, Division of Alco Food Service Equipment Company

Filed Jan. 30, 1984, Ser. No. 575,053
Int. Cl.[4] B08B 3/06
U.S. Cl. 134—141 **5 Claims**

1. A food products washing and drying machine comprising, in combination, a flat, circular spinner table, means for rotating said spinner table about a vertical axis, a spinner basket, said spinner basket being symmetrical about its vertical axis of generation, said spinner table having an upstanding rim providing a shallow circular recess at the top thereof, said spinner basket comprising a circular bottom wall integrally formed with an upstanding peripheral wall portion receivable in interfitting relation within said spinner table recess to provide for rotation of said spinner table and said spinner basket in unison, said spinner basket further comprising a radially outwardly-extending peripheral wall portion merging with said rim portion and a comparatively long, upwardly-extending sidewall portion merging with said outwardly-extending peripheral wall portion, said sidewall portion being inclined radially inwardly from bottom to top, the juncture of said outwardly-extending portion and said upwardly-extending sidewall portion being provided, about its periphery, with a plurality of through openings for the discharge of water from said spinner basket, the upper end of said spinner basket sidewall portion terminating in a comparatively short, rounded, inwardly-directed lip portion, a base member, said spinner table being rotatably journalled with respect to said base member, a wash water spray head fixed with respect to said base member at one side thereof and positioned over said spinner basket so as not to interfere with sideward removal of said spinner basket with



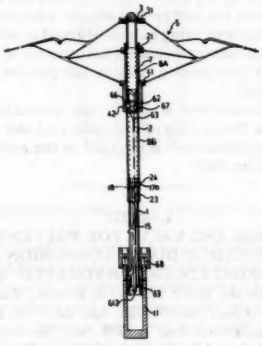
respect to said spinner table when said spinner basket is supported on said spinner table, and means for connecting said water spray head with a source of water supply under pressure for washing food products in said spinner basket.

4,548,222

FULL-AUTOMATIC UMBRELLA

San-Tong Day, 1 Chung Yang North Rd., Ching Shui, Taichung Hsien, Taiwan

Filed Feb. 7, 1984, Ser. No. 577,820
Int. Cl.[4] A45B 25/14
U.S. Cl. 135—24 **4 Claims**



1. A fully automatic collapsible umbrella comprising:

a lower inner tubular shaft provided with a handle at a lower end portion thereof;

a first spring pawl being fixedly attached at an upper end of the lower inner tubular shaft and having a free lower end with a first locking head and an intermediate portion with a second locking head and a spring biased ball disposed inside said lower inner tubular shaft at its upper end;

an outer tubular shaft slidably mounted on the upper end portion of said lower inner tubular shaft and provided

with an intermediate ring disposed at an upper end portion thereof;

a sleeve and second spring pawl disposed inside said outer tubular shaft, said second spring pawl retractably mounted inside said sleeve;

an upper inner tubular shaft mounted in the upper end portion of said outer tubular shaft and provided with an upper ring disposed at a top portion thereof;

a sliding tubular member slidably mounted on said outer tubular shaft and provided with a lower ring mounted on an upper end portion and an opening in a lower end portion thereof;

a rib assembly comprising a plurality of first main ribs, a plurality of first auxiliary ribs, a plurality of second main ribs, a plurality of second auxiliary ribs and a plurality of supporting ribs, said ribs being pivotally interconnected with said upper, lower and intermediate rings to form an umbrella frame for opening and closing thereof;

control means including a ring member and a pulling rod for controlling engagement and disengagement of said first and second spring pawls, respectively, so as to open and close the umbrella, said ring member disposed about said lower inner tubular shaft and adjacent a top end portion of said handle;

a first coil spring for closing the umbrella mounted above the upper end portion of said outer tubular shaft and between said intermediate and lower rings;

second and third coil springs for opening the umbrella disposed inside said outer tubular shaft, said second coil spring being located between a lower end of said upper inner tubular shaft and said sleeve and said third coil spring being located between said sleeve and an upper end of said lower inner tubular shaft;

said handle being provided with a cavity for receiving a lower end portion of said pulling rod;

said lower end portion of said lower inner tubular shaft provided with an elongated opening for receiving said first and second locking heads of said first spring pawl;

said outer tubular shaft being provided with a notch in a lower end for receiving said second locking head when the umbrella is closed, an aperture disposed slightly above said notch for engaging said ball when the umbrella is opened and an opening in a middle portion for engaging said second spring pawl when the umbrella is closed;

wherein, when the umbrella is closed, said second locking head of said first spring pawl is engaged in said opening of said sliding tubular member, said second spring pawl is engaged in said opening in the middle portion of said outer tubular shaft;

and, when the umbrella is opened, said second spring pawl is engaged in the opening of said sliding tubular member and said spring biased ball is engaged in the aperture of said outer tubular shaft.

4,548,223

METHOD AND VALVE FOR PREVENTING ELECTROKINETIC INDUCED CORROSION EROSION OF METERING EDGES IN HYDRAULIC VALVES

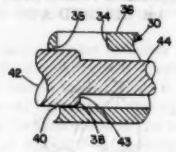
David W. Kirkbride, 16605 SE. 144th, Renton, Wash. 98055

Continuation of Ser. No. 679,723, Apr. 23, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,523

Int. Cl.[4] F16K *3/24, 11/07, 25/04*

U.S. Cl. 137—1 **2 Claims**

1. In the control of the flow characteristics of phosphate ester based hydraulic fluid or the like through a closed hydraulic valve having a pair of relatively movable members, one valve member having a wall and a port through the wall forming a portion of the flow path through the valve, the wall and port intersecting to thereby form a first, sharp, metering edge having an included angle of 90° or less, the other valve member being in parallel, close fitting, sliding relationship with the wall and port of the first valve member and including a second, sharp metering edge thereon having an included angle of 90° or less, the second member being movable with respect to the first member to close the port and thereby define a valve closed or null position wherein the first and second edges are adjacent one another and define a locale of minimum separation therebetween, the locale being such that under a condition of seepage or leakage therethrough, volume of flow is low and velocity is high: a method of reducing or eliminating electro-



chemical corrosion erosion of the first and second edges at the locale by reducing the rate of change of flow approaching the locale comprising the step of contouring the first and second edges at the locale so that, immediately to either side of the locale, angles of convergence towards the locale are defined by the contoured surfaces, the angles of convergence each being within a range of about from more than 0° to 45°.

4,548,224

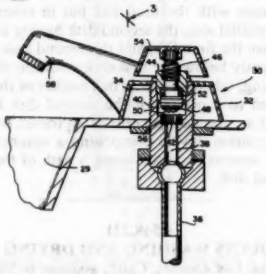
FAUCET REPAIR SYSTEM

Robert McLaughlin, 1107 Brown St., Peekskill, N.Y. 10566

Filed Oct. 17, 1984, Ser. No. 661,955

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—15 **14 Claims**



12. A method of removing materials lodged in a faucet or water feed line, the faucet having a body, an operative component seated within the body, a retaining element means for retaining the operative component within the body, means for securing the retaining means to the faucet body and a handle means for moving the operative component to adjustably control water flow through the faucet body during normal operation by the method employing a coupling means having an unobstructed flow path and connecting means engageable with the faucet body, the method comprising the steps of

(a) closing a shutoff valve to terminate water supply through the water feed line,

(b) disassembling the faucet by

(i) removing the handle means

(ii) releasing the securing means,

(iii) removing the retaining means and removing the operative component,

(c) attaching the coupling means to the faucet body by engaging the connecting means with the faucet body in a manner identical to that of the means securing the retaining means to the faucet body,

(d) providing a receptacle for the collection of water and the material to be dislodged,

(e) opening the shutoff valve to commence water flow through the water feed line, and

(f) directing the flow of water and the removed material from the coupling means to the receptacle.

4,548,225

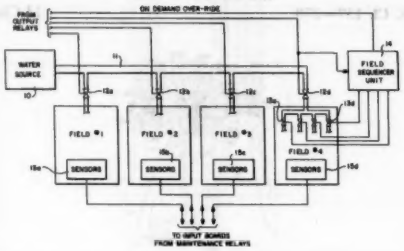
IRRIGATION CONTROL SYSTEM

Dwight J. Busalacchi, 181 Simpson Dr., Daly City, Calif. 94015

Continuation-in-part of Ser. No. 306,008, Sep. 28, 1981, abandoned. This application Sep. 9, 1982, Ser. No. 416,170

Int. Cl.⁴ A01G *25/16*; **G01N** *19/10*

U.S. Cl. 137—78.3 **14 Claims**



1. An irrigation control system for irrigating a predetermined number of different agricultural fields comprising:

for each of said fields main distributing means for distributing water to the field from a water source including main valve means for controlling the flow of water from said water source to said main distributing means;

at least one unitary tensiometer means in each of said fields for sensing soil moisture to such field having a liquid filled vacuum port, such vacuum being indicative of the amount of soil moisture and including solid-state electrical means physically connected to said vacuum port for providing a continuous real time quantitative analog electric signal indicative of the amount of such moisture;

automatic control means connected to said main valve means and responsive to said analog signals for initiating the flow of water to a field in response to said analog signal coinciding with a first preset "START" value and for discontinuing such flow of water in response to said analog signal coinciding with a second preset "STOP" value different from said first value.

4,548,226

APPARATUS FOR ADJUSTING THE CONCENTRATION OF OIL IN A WATER-CONTAINING OIL MATERIAL

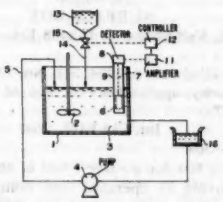
Mitsuaki Iino, and Hideo Kanamori, both of Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,139

Claims priority, application Japan, Feb. 8, 1983, 58-18167

Int. Cl.⁴ G05D *11/06, 11/13*

U.S. Cl. 137—91 **19 Claims**



1. An apparatus for adjusting the concentration of oil in a water-containing oil material, comprising:

a tank for holding a water-containing oil material;

stirring means in said tank for stirring said oil material in said tank;

a plummet suspended in said oil material in said tank;

a protective cylinder around said plummet in said tank, said protective cylinder being imperforate at the portions thereof opposite said plummet;

a detector coupled to said plummet for detecting a change in buoyancy exerted on said plummet by said oil material in said tank;

a water supply means coupled to said tank;

a water supply-control valve coupled to said water supply means for controlling the supply of water to said tank via said water supply means; and

signal generating means coupling said detector to said control valve for opening and closing said control valve responsive to said detecting of said change in buoyancy of said plummet, to thereby control said supply of water to said tank to adjust the oil concentration of said oil material in said tank.

4,548,227

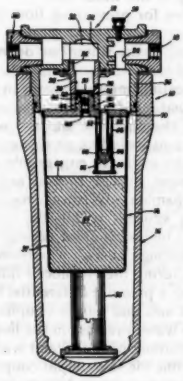
CHEMICAL FEEDER DEVICE

Perialwar Regunathan, Wheaton; John W. Tadlock, West Chicago, and Dean J. Jarog, Villa Park, all of Ill., assignors to Everpure, Inc., Westmont, Ill.

Continuation-in-part of Ser. No. 430,480, Sep. 30, 1982, abandoned. This application Sep. 15, 1983, Ser. No. 532,123

Int. Cl.⁴ B01D *11/02*

U.S. Cl. 137—268 **47 Claims**



1. A chemical feeder device for treatment of influent liquid comprising:

(a) a head member adapted to be disposed in a liquid inlet line, said head member having an inlet and an outlet;

(b) a replaceable cartridge member connected to said head member constructed and arranged to provide liquid communication between said inlet and outlet, said cartridge containing a chemical material;

(c) a vessel detachably connected to said head member and surrounding said cartridge member;

(d) a bypass orifice disposed in the path of flow from the inlet of said head member to said outlet of said head member;

(e) an inlet opening in the upper wall of said cartridge member in liquid communication with the inlet of said head member;

(f) outlet means formed in the upper wall of said cartridge member for liquid communication with said outlet of said head member;

(g) said outlet means in the upper wall of said cartridge

member including a capillary tube and porous filter plugs disposed on each side of said capillary tube.

4,548,228

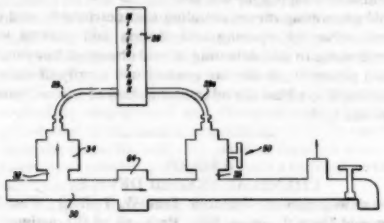
CHEMICAL FEEDER

Stephen D. Moore, 1230-17th Ave., N. Lake Worth, Fla. 33460, and Murrill Maglio, 305 Cypress Ave., West Palm Beach, Fla. 33406

Continuation of Ser. No. 212,105, Dec. 2, 1980, Pat. No. 4,407,322. This application Sep. 30, 1983, Ser. No. 537,791

Int. Cl.[4] B01D *11/02*

U.S. Cl. 137—268 **2 Claims**



1. A device for controlled, pressure-actuated feeding of a water-soluble chemical into a water line having a pressure varying between a minimum and a maximum in the line, comprising:

an input coupling to the water line;

a first check valve for preventing flow back through said input coupling;

an output coupling to the water line downstream from said input coupling;

fluid-tight chemical mixing tank means in fluid communication between said input and output couplings for permitting mixing of the chemical and the water therein, said mixing tank means including an elongated vertical cylinder divided into sealingly engageable upper and lower sections, chemical storage means, and a chemical and water mixing chamber, said storage means and said mixing chamber being situated within the cylinder, said fluid communication including fluid passage into said mixing chamber and through at least a portion of said chemical storage means during the chamber's filling cycle; and

means for creating a pressure differential between said mixing tank means and said output coupling as a result of a decrease in the water pressure in the line below the maximum, thereby forcing chemical and water from said tank means into the line via said output coupling, said pressure differential creating means including an air reservoir situated in said mixing tank means and a control valve between said tank means and said output coupling, said control valve being set at a restricted flow value with respect to said input coupling, whereby the contents of said tank means are fed through said control valve by the pressure in said air reservoir acting on said contents when the water pressure in the water line decreases below the pressure in said air reservoir, both said chemical storage means and said mixing chamber being subject to the pressure of said air reservoir, wherein said air reservoir is primarily in said upper section and wherein said chemical storage means comprises an elongated vertical cylindrical contained closed at its bottom and an elongated vertical cylindrical tube positioned substantially concentrically within said container, said container extending from near the bottom of the mixing chamber upward through the lower section and into the upper section of said cylinder, said container having an aperture in the circumferential wall thereof lying within said lower section and adapted to be within the fluid of said chemical and water mixing chamber during a portion of each filling cycle of said chamber, and said tube having at least one perforation in its lower circumferential wall and said tube extending close to the bottom of said container.

4,548,229

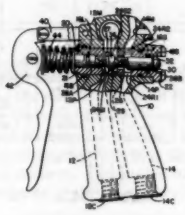
OPEN-CLOSED CENTER HYDRAULIC VALVE ASSEMBLY

C. Donald Johnson, Fairmont, Minn., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Apr. 8, 1981, Ser. No. 252,053

Int. Cl.[4] F16K *11/07*

U.S. Cl. 137—270 **13 Claims**



1. An apparatus having a body housing, a motor powered by pressurized fluid, a valve for controlling the flow of pressurized fluid to said motor, said valve attached to said body housing, a motor actuator operably connected to said valve and adapted to change the valve between an ON state wherein pressurized fluid flows to power said motor and an OFF state wherein pressurized fluid does not flow to power said motor; and wherein said valve includes a spool having an axis and disposed at least partly in a cavity within a sleeve, said motor actuator is operative to shift said valve between the ON state and the OFF state by causing state-changing movement of at least a part of said valve; and said valve is further adapted for a condition-changing movement of at least a part of said valve to change said valve between a normally closed condition having an OFF state with substantially no flow of pressurized fluid through said valve and a normally open condition having an OFF state with a continuous flow of pressurized fluid in said sleeve, and said condition-changing movement is a rotation of at least a part of said valve, and wherein said valve is further adapted to allow said condition-changing movement with said spool remaining at least partly within said sleeve, and wherein said motor actuator is disposed at least partly externally on one side of said housing and a rotatable adjustor is disposed on a side of said housing opposite said one side, and said adjustor is operative to change the valve between a normally closed condition and a normally open condition.

4,548,230

SURFACE BOX

Josef Feit, St. Veit-Strasse 7, D-8488 Erbendorf, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 576,240

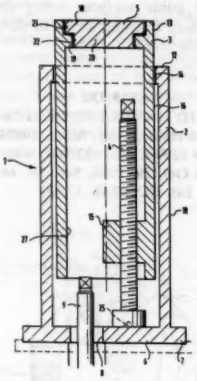
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3307017

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—369 **23 Claims**

1. A surface box for a valve fitted in underground piping, said valve having an operating rod, comprising a tube-like supporting frame, a rod guard sleeve slidingly positioned in said supporting frame, a thrust screw for supporting said rod guard sleeve on said supporting frame, said rod guard sleeve being keyed within said supporting frame, said rod guard

sleeve and supporting frame including tortion-resistant means for preventing rotation of said rod guard sleeve relative to said



supporting frame and at least one guide ridge for preventing said rod guard sleeve from tilting in said supporting frame.

4,548,231

PILOT-OPERATED PRESSURE-LIMITING VALVE WITH A FEEDING FUNCTION

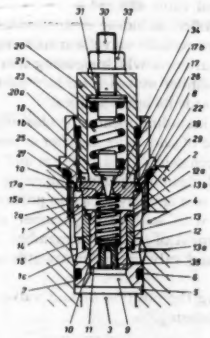
Franz-Josef Schwede, Promenade 5, 7900 Ulm, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,326

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2848208

Int. Cl.⁴ F16K *7/10*

U.S. Cl. 137—491 **1 Claim**



1. A pilot-controlled pressure limiting valve with a feeding function, comprising a housing bounding a control pressure chamber; a high pressure inlet formed with a seat in communication with the pressure chamber; a main spool movable in two opposite directions between the pressure chamber and the seat and having a throttle between the high pressure inlet and the pressure chamber; a low pressure outlet formed in the housing transversely to the path of movement of the main spool; a stationary abutment provided in said housing in the range of the outlet; one end of said main spool cooperating with said seat to control communication between said inlet and said outlet and the other end of said spool facing said pressure chamber being provided with stop means; an annular piston slidably surrounding said main spool between said pressure chamber and said abutment, said annular piston being engageable with said stop means on said spool to displace the same from said seat surface when pressure of working medium in said outlet exceeds pressure of working medium in said pressure chamber, and wherein during the closing position of the main spool the clearance between the stationary abutment in the housing and the stop means on the main control spool slightly exceeds the axial length of said annular piston.

4,548,232

VALVE ASSEMBLY

Robert K. Rusteberg, Barrington Hills, Ill., assignor to Panmatic Company, Elk Grove Village, Ill.

Filed Apr. 12, 1984, Ser. No. 599,494

Int. Cl.⁴ F16K *31/20*

U.S. Cl. 137—519 **6 Claims**

1. A flow and floating check valve assembly for use in a system to provide for the flow of a first fluid to a second fluid and to automatically interrupt the backflow of said second fluid through said assembly, said check valve assembly comprising an elongated hollow valve body defining an inner chamber, a first fluid inlet port at one end and a first fluid outlet at the opposite end, a float in said inner chamber, a hollow sleeve in said outlet port defining an elongated passageway to said inner chamber and having an exterior valve seat surrounding said passageway, a stem connected for relative movement to said float and extending through said passageway, said stem being dimensioned to provide an annular passage for fluid flow, a valve element on the outer end of said stem so that flow of said second fluid under pressure toward said outlet port will cause said valve stem to raise and seat said valve element on said valve seat by the pressure on the outer end of said stem or flow of the second fluid through said annular passageway into said inner chamber will raise said float and lift said stem to seat said valve element on said valve seat, said float including an elongated cylindrical member closed at its upper end and having a reduced portion at its lower end defining a reduced neck surrounding said outlet and having notches on the end of said neck to provide fluid communication to said inner chamber.

4,548,233

ELECTRICALLY CONTROLLED PRESSURE RELIEF VALVE INCLUDING A HYDRAULIC BIAS

Hans Wölfges, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 600,842

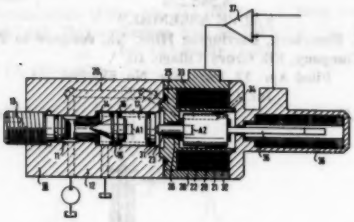
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315222

Int. Cl.⁴ F16K *17/06*

U.S. Cl. 137—529 **6 Claims**

1. A pressure relief valve comprising a pressure inlet, a relief line adapted to communicate with a reservoir, a valve seat interposed between said inlet and said relief line, a closing element for controlling the communication between said pressure inlet and said relief line through said valve seat, said

closing element having an area to which the system pressure is applied in a direction to open said closing element, spring means biasing said closing element into engagement with said valve seat, the bias force of said spring means being controlled by a proportional magnet having an armature which acts on said spring means through an actuating element, said spring means being contained within a spring retaining chamber



adapted to be connected to the reservoir, characterized by means provided for applying system pressure to the inner space of said proportional magnet and for generating a differential hydraulic force on the armature of said proportional magnet and said actuating element acting to increase the bias force of said spring means, and a seal between said spring retaining chamber and said inner space of said proportional magnet.

4,548,234

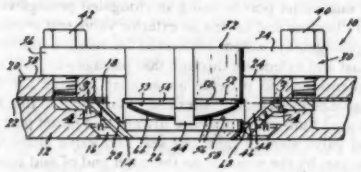
DISCHARGE VALVE ASSEMBLY

Werner H. Prenger, Coldwater, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 318,053, Nov. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 234,343, Feb. 13, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 580,779

Int. Cl.⁴ F16K *15/02*

U.S. Cl. 137—543.19 **4 Claims**



1. An improved valve assembly for use in compressors, comprising:

a valve plate adapted for controlling fluid from a compression chamber of said compressor and having a circularly shaped discharge opening therethrough,

the sidewalls of said opening defining a valve seat having an increasing diameter in a direction away from said compression chamber;

a disc-shaped valve member positioned within said opening for movement to and from a closed position in which it is in sealing engagement with said valve seat,

said valve member being formed of a compliant polymeric material;

a bowed leaf spring formed of metal and positioned in alignment with said valve member,

the convex center portion of said leaf spring acting against said valve member and biasing it into a closed position; and

a bridge member overlying said discharge opening and fixed in position with respect to said valve plate,

said bridge member having means defining guide surfaces extending into said opening and surrounding the peripheral edge of said valve member and said leaf spring so as to maintain said leaf spring and valve member generally in alignment with one another and said discharge opening, said guide surfaces being normally radially spaced from the peripheral edge of said leaf spring when said valve member is in a closed position, and said means defining said guide surfaces being spaced from the sidewalls of said opening so as to define a discharge passage therebetween.

4,548,235

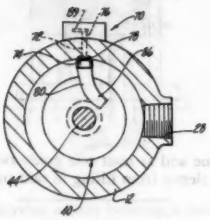
FLUID HANDLING DEVICE

Nils O. Rosaen, 2139 Heide, Troy, Mich. 48084

Continuation-in-part of Ser. No. 523,109, Aug. 15, 1983. This application Oct. 29, 1984, Ser. No. 666,188

Int. Cl.⁴ F16K *37/00*

U.S. Cl. 137—557 **10 Claims**



1. A fluid handling device comprising:

a housing having an inlet, an outlet and a fluid passageway between said inlet and outlet,

check valve means for preventing fluid flow through said passageway from said outlet and to said inlet, said valve means comprising a valve member and a valve seat contained in said housing, said valve seat forming a port in series with said fluid passageway, said valve member movable between an open and a closed position with respect to said valve seat,

said valve member including a surface which cooperates with a surface on said valve seat to form an opening between said surfaces, which opening increases in area as said valve member moves from said partially open position and towards its open position,

said valve seat including means for cleaning said first mentioned surface of said valve member as said valve member moves between said closed position and a partially open position, said cleaning means comprising a seal mounted to said valve seat and having a flap portion extending into engagement with said valve member through at least partial movement of said valve member

means urging said valve member towards said closed position, and

means indicating the position of said valve member exteriorly of said housing.

4,548,236

VEHICLE SUPPORTED FOLDABLE SERVICE CONDUIT

George W. Bloomquist, Long Beach, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 6, 1983, Ser. No. 482,687

Int. Cl.⁴ F16L *27/00*

U.S. Cl. 137—615 **4 Claims**

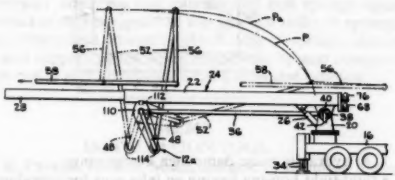
4. A fold control mechanism in a foldable conduit system supported by an extensible boom on a movable vehicle; said conduit system including parallel outboard and inboard pipes adjacent opposite walls of said boom, a short pipe coupled for rotation to the outboard, another short pipe section coupled for rotation to the inboard pipe section, and a diagonal pipe section coupled for rotation to the other ends of said short pipe sections; and power means connected to said outboard pipe

section for controlling movement of said outboard pipe section relative to said boom for folding and unfolding said foldable conduit system; the improvement comprising:

first wheel means rigidly secured to said boom and having an axis of generation;

second wheel means spaced from said first wheel means and rigidly connected to said diagonal pipe section, said second wheel means being rotatable about its own axis and rotatable about the axis of said first wheel means, said second wheel means having a diameter smaller than that of said first wheel means; and

flexible connecting means being trained around said first and second wheel means, said first and second wheel means



having a peripheral ratio responsive to said power means for moving said diagonal pipe section from one side of a plane that is substantially normal to said boom to the other side of said plane thereby causing the short pipe sections to move through said plane to opposite sides of said plane when said diagonal pipe section is within the plane thereby permitting reliable folding and unfolding of said boom;

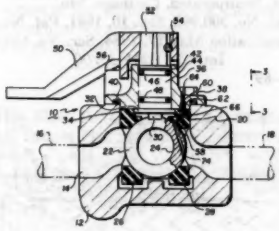
said first wheel means being an elliptical sheave, said second wheel means being a small diameter sheave, and said flexible connecting means being a pair of cables having end portions anchored to said elliptical and small diameter sheaves.

4,548,237

BALL VALVE WITH IMPROVED VENT STRUCTURE

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 14, 1983, Ser. No. 561,492
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—625.22 **12 Claims**



1. An improved ball valve comprising:

a valve body having a fluid passage therethrough;

a valve ball element having a central passage;

a pair of annular seals positioned in said body, one on each side of said valve ball element, each said seal surrounding said fluid passage;

means for rotatably supporting said ball element within said body and in engagement with said seal; for closing said valve when said central passage is transverse to said fluid passage; and for opening said valve when said central passage is aligned with said fluid passage;

a first vent passage through said valve body and through one of said annular seals, said first vent passage being blocked by said ball element when said valve is open;

a flow restrictor element positioned between said valve body and said one seal, said restrictor element having a bore forming a portion of said first vent passage; and

a second vent passage through said ball element, said second vent passage being connected with said first vent passage and said fluid passage on one side of said ball element when said valve is closed,

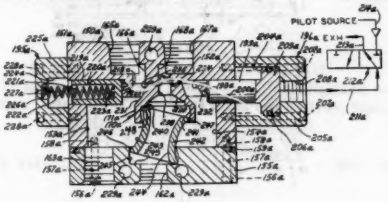
whereby fluid under pressure on said one side of said ball element is vented to the exterior of said valve body when said valve is closed.

4,548,238

DIRECTIONAL CONTROL VALVE WITH STRAIGHT THROUGH FLOW

William J. Chorkey, 34300 Lyncroft, Farmington, Mich. 48024

Filed Dec. 19, 1983, Ser. No. 563,060
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.25 **5 Claims**



1. A reversing fluid direction control valve, characterized in that it includes:

(a) a valve body having an enclosed chamber therein and at least two oppositely disposed sides;

(b) outlet port means formed through one of said two sides of said valve body and communicating with said chamber;

(c) an inlet port means formed through the other of said two sides of said valve body, and communicating with said chamber;

(d) exhaust port means in the valve body and connecting said chamber to the exterior of the valve body;

(e) a slider valve element means disposed in said chamber and being movable between a first operating position and a second operating position, for selectively directing pressurized fluid entering said inlet port means to said outlet port means in a straight through flow path;

(f) passage means for conducting fluid entering said outlet port means to the exhaust port means;

(g) operator means for moving said slider valve element means to said first operating position and to said second operating position;

(h) the valve body includes a bottom side wall, and a top side wall having a lower side surface;

(i) said outlet port means is formed through said top side wall, and the inlet port means is formed through said bottom side wall; and,

(j) said slider valve element means includes,

(1) a slider valve element body provided with an inlet passage therethrough for selective communication with said inlet port means, and being slidably mounted in said chamber and having one end slidably engaging the top said wall lower side surface when it is moved between said first and second operating positions; and,

(2) a conduit rocker member having its upper end rockably connected to the other end of the slider valve element body, and with its lower end rockably connected to the valve body bottom side wall, and wherein said conduit rocker member is provided with an inlet passage therethrough which communicates at the upper end thereof with the inlet passage through the slider valve element body and which communicates at the

lower end thereof with the inlet port means in the valve body bottom side wall.

4,548,239

HYDRAULIC SLIDE VALVE

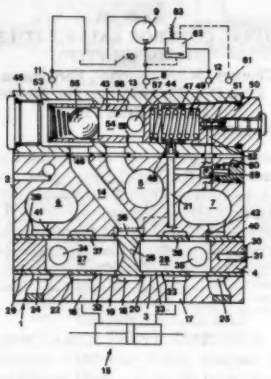
Christian Eskildsen, Nybol, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 16, 1984, Ser. No. 570,854

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3302000

Int. Cl.⁴ F15B *13/02*

U.S. Cl. 137—625.68 **3 Claims**



1. A hydraulic control valve, comprising, a housing having a cylindrically shaped bore, said housing having pump and tank connections and two servomotor load connections, said bore having a supply orifice, said bore having a pair of metering control orifices on opposite sides of said supply orifice in closely spaced relation thereto, said bore having a pair of inner load control orifices on opposite sides of said metering control orifices, said bore having a pair of outer exhaust orifices on opposite sides of said load control orifices, all of said orifices being in the form of annular grooves, said housing having passage means connecting said supply orifice to said pump connection and passage means connecting said load control orifices to said load connections, said housing having passage means connecting said exhaust orifices to said tank connections, a slide member disposed in said bore and being axially displaceable relative thereto, said slide member having axially inner and outer changeover ports cooperable with said orifices upon movement of said slide member in opposite directions to selectively connect opposite ones of said motor connections to said pump and tank connections, said inner changeover ports being separated by a center section which when said slide member is in a neutral position covers said supply orifice and places said metering orifices in fluid throttling communication with said inner changeover ports, said slide member having two cavities formed by two end walls and a central wall, said inner and outer ports having fluid communication with said cavities with said inner ports being adjacent said central wall and said outer ports being adjacent said end walls, said metering control orifices being sufficiently closely adjacent said supply orifice that when in operation when said supply orifice is partially overlapped by one of said inner ports one of said metering control orifices on the opposite side of said supply orifice is closed by said central section of said slide member, the inner edges of said inner changeover ports partially overlapping both of said metering control orifices when said slide member is in the neutral position, and said housing exhaust orifices having their axially inner edges slightly overlapping said slide member outer changeover ports in the neutral position.

4,548,240

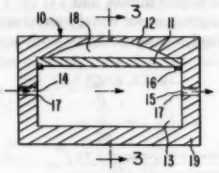
HYDRAULIC PULSE DAMPENER EMPLOYING STIFF DIAPHRAGM AND NESTING MEMBER

Stephen H. Graham, Alameda, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 487,371, Apr. 21, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 640,061

Int. Cl.⁴ F16L *55/04*

U.S. Cl. 138—30 **9 Claims**



1. A hydraulic pulse dampener, comprising:

a fluid-tight housing having an inlet port for introduction of a fluid into said housing, an outlet port for discharge of said fluid from said housing, and a contoured recess, and

a diaphragm positioned within said housing adjacent said recess, the region between said diaphragm and said recess being sealed from said fluid, the diaphragm being made of a material that will flex towards said recess to assume a nesting position therein at some predetermined rise in pressure of said fluid, absorb hydraulic pulse energy of said fluid and store said energy as elastic strain energy,

said recess being contoured such that the proportion of the diaphragm which is nested within said recess varies in a predetermined manner within a predetermined range of pressure, whereby at the lowest pressure of said range of pressure only a small portion of said diaphragm is nested within said recess, while at the highest pressure of said range of pressure the diaphragm is fully nested within said recess.

4,548,241

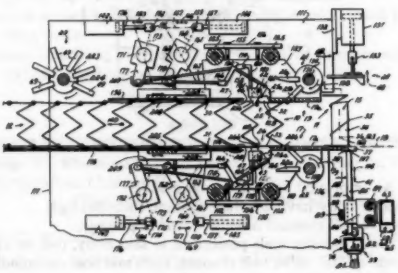
COIL SPRING ASSEMBLY MACHINE

Henry Zapletal, Carthage, Mo.; Horst F. Wentzek, and George M. Chembakaffery, both of Kenosha, Wis., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 300,995, Sep. 10, 1981, Pat. No. 4,492,298. This application May 17, 1984, Ser. No. 611,490

Int. Cl.⁴ B21F *35/00*

U.S. Cl. 140—89 **6 Claims**



1. A machine for sizing a group of coil spring to a predetermined desired height during fabrication of a coil spring assembly, said machine comprising

a machine frame,

an elongated support platen mounted upon said frame for supporting a plurality of said springs positionable on said support platen in desired group configuration with said springs' axes being generally normal to said platen,

an elongated compression bar positioned on said frame in a location spaced from said support platen, said bar being adapted to simultaneously engage the top end loops of coil springs positioned on said support platen, and

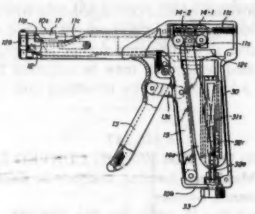
means mounted upon said frame for moving said compression bar in a direction generally normal to said support platen, said compression bar being moveable between extended and retracted positions relative to said support platen, said compression bar being moved into said extended position from said retracted position so as to simultaneously compress said plurality of coil springs upon contact of said bar with the top loops of said coil springs, a predetermined desired height of said coil springs relative to said support platen being established by said compression bar in said compression bar's extended position.

4,548,242

INSTALLATION TOOL

Joseph R. Paradis, Holden, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 935,207, Aug. 21, 1978, now Re. 29,973.
This application Feb. 12, 1979, Ser. No. 11,725
The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.
Int. Cl.⁴ B21F *9/02*
U.S. Cl. 140—123.6 **5 Claims**



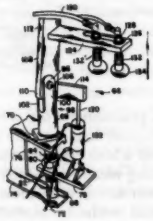
1. An installation tool comprising means for gripping, tensioning and severing an item; and means connected to the tool for limiting the ejection of the severed item in the direction of tensioning, wherein the limiting means includes an ejector spring that is mounted for applying lateral pressure to said item with respect to the direction of tensioning.

4,548,243

APPARATUS FOR AUTOMATICALLY PLACING BAGS

Jose A. Diaz, Tampa, Fla., assignor to General Portland, Inc., Dallas, Tex.

Filed Nov. 4, 1983, Ser. No. 548,681
Int. Cl.⁴ B65B *3/17*
U.S. Cl. 141—114 **27 Claims**



1. An apparatus for automatically opening valve vented bags and for transferring the opened bags from a bag conveyer and for placing the bag sequentially on filling spouts of a packaging machine, the apparatus comprising in combination:

a fixed framework;

first table means connected to said framework and disposed adjacent said bag conveyer for sequentially receiving said bags from said bag conveyer;

a first bag clamping means disposed adjacent said first table means for sequentially clamping said bag against said first table means;

a first retractable suction means cooperating with said valve vented bags for opening said clamped bags;

a first bag gripping means for gripping said opened bag;

a first carriage means for supporting said first bag gripping means; and

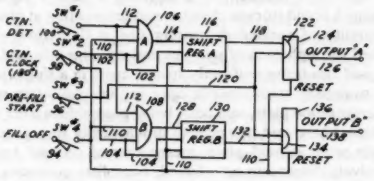
a first rail means for supporting and guiding said first carriage means, said first rail means being pivotably secured to said framework such that said first carriage means is sequentially guided to a plurality of the filling spouts.

4,548,244

ELECTRONIC PROGRAM CONTROL

Frank D. Risko, Livonia, and Thomas D. Lewis, Highland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 29, 1984, Ser. No. 676,361
Int. Cl.⁴ B65B *57/02*
U.S. Cl. 141—156 **10 Claims**



1. In an electronic program control for controlling the filling of cartons on a machine having a conveyor indexing at a particular rate and a plurality of mandrels for carrying cartons and indexing at twice the rate of the conveyor, said cartons being bottom sealed on said mandrels and transferred from successive mandrels onto the indexing conveyor so as to be indexed in aligned pairs beneath dual filler units, and the circuitry therefor, the combination comprising:

(a) a carton detection switch for detecting the passage therepast of said individual cartons and providing a signal for each;

(b) a carton clock switch for providing two signals for each index of said conveyor;

(c) a fill-off switch for providing a signal for each index of said mandrels;

(d) a pre-fill start switch for providing a signal for each index of said conveyor;

(e) first and second AND gates for providing respective signals upon receipt of simultaneous signals from each of said carton detection, carton clock, and fill-off switches;

(f) first and second shift registers for providing respective signals upon receipt of simultaneous signals from each of said respective first and second AND gates, said carton clock switch, and said fill-off switch; and

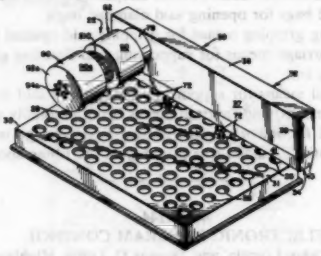
(g) first and second flip flops for providing respective signals to said respective dual filler units upon receipt of simultaneous signals from each of said respective shift registers and said pre-fill start switch, for assuring that said respective filler units are operative only when a carton is indexed therebeneath.

4,548,245

DISPOSABLE/REUSABLE DISPENSER FOR DISPENSING CONTAMINATABLE AND NONCONTAMINATABLE LIQUIDS

William H. Crandell, Hobe Sound, Fla.; John L. Moren, Arlington, Va., and Paul Q. Ruona, Silver Spring, Md., assignors to Dynatech Laboratories Incorporated, Alexandria, Va.

Filed Mar. 4, 1983, Ser. No. 472,104
Int. Cl.[4] B01L *11/00*
U.S. Cl. 141—237 **25 Claims**



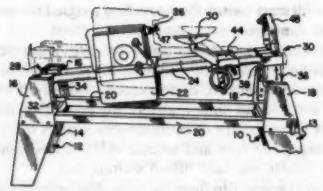
14. A disposable hand-held dispenser for dispensing microliter quantities of non-contaminatable and contaminatable liquids, including bacteria-containing suspensions, in chemical and biological procedures, comprising a hollow rigid body defining a liquid storage chamber and terminating at one end in a plurality of parallel dispensing tips, a fluid flow passage formed through each of said tips and opening into said chamber, said tips being uniformly spaced apart in a single straight row to register with separate open top microtitration wells in a microtitration plate, said body being placeable in a dispensing position where said tips project downwardly to register with certain wells in said plate, means carried on said body for selectively dispensing preselected, microliter quantities of the liquid stored in said chamber simultaneously through the fluid flow passages of said tips for reception in the wells of said plate, and seating means on said tips, said seating means being disposed to seat against portions of said plate for enabling said body to be supported on said plate while it is being grasped in the user's hands during the dispensing of liquid into the wells of said plate.

4,548,246

HEADSTOCK ELEVATING APPARATUS

John G. Legler, Huber Heights; Robert L. Bartlett, Dayton; Charles J. Haas, Middletown; Garry W. Woods, and John O. Clark, both of Dayton, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Nov. 16, 1983, Ser. No. 552,586
Int. Cl.[4] B27C *9/00*
U.S. Cl. 144—1 C **11 Claims**



1. In a multipurpose woodworking tool of the type having a frame, a pair of parallel way tubes extending longitudinally of said frame, and a headstock mounted on said way tubes, the improvement comprising:

first and second yoke means for joining said way tubes together at opposite ends thereof;

first and second support means extending upwardly from said frame at opposite ends thereof and located adjacent to said first and second yoke means, respectively; and

means forming a plurality of releasable pivot connections between each pair of said first yoke means and said first support means, and said second yoke means and said second support means, said pivot connection means including a pair of first components, each attached to a different one of said first and second yoke means, and a pair of second components, each attached to a different one of said first and second support means and adapted to engage a corresponding one of said first components to form said pivot connection at a low position relative to said frame and at least one high position relative to said frame and located above and offset from said low position;

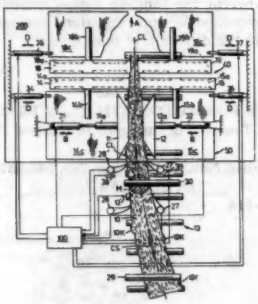
whereby said way tubes and headstock may be adjusted from a low position to a high position by a procedure in which (a) said first component on said second yoke means is disengaged from said low position on a corresponding one of said second components on said second support means, (b) said second yoke means is raised and said first component thereof is attached to said high position of said corresponding second component, thereby pivoting said first component of said first yoke means relative to said corresponding second component of said first support means, (c) said first component of said first yoke means is disengaged from said low position of said second component is said first support means, and (d) said first yoke means is raised and said first component thereof engages said high position of said corresponding first component, thereby pivoting said first component of said second yoke means relative to said second component engaged therewith; and said headstock may be adjusted from a high position to a low position by reversing said procedure.

4,548,247

METHOD OF PROCESSING CURVED LOGS

Urban Eklund, Munkfors, Sweden, assignor to Kockums Industri AB, Soderhamn, Sweden

Filed Dec. 1, 1983, Ser. No. 556,948
Claims priority, application Sweden, Dec. 9, 1982, 8207023
Int. Cl.[4] B27B *1/00*
U.S. Cl. 144—357 **9 Claims**



1. A method of processing a log which in a plane of curvature has a curved center line with the use of apparatus including a computer unit where command signals are generated for operating positioning means by which the relative position of the log with respect to working tools of a working machine can be changed, said method comprising the steps of

positioning a crude log ith an essentially circular cross-section in a rotary condition where its plane of curvature is horizontal,

measuring the plan view hape of the positioned crude log,

transmitting the measurements to the computer unit so as to generate command signals which define a theoretical value of curvature corresponding to the measurements freed from accidental irregularities caused by knots and the like,

feeding the log with its plane of curvature horizontal through a working machine and utilizing the command signals to effect a first machining cycle which processes the log along curved working paths defined by said theoretical value of curvature so as to obtain at least a central yield block defined by worked, vertically extending faces curved in accordance with the said theoretical value of curvature, and by horizontally extending upper and lower faces extending essentially straight in the direction of the center line, and

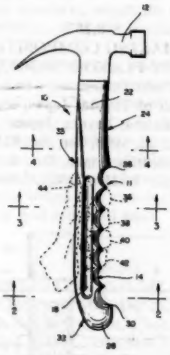
feeding said block through a working machine for further division without any change in the rotary condition and before the worked faces established in the first cycle appreciably could have changed their shape due to drying and utilizing the same command signals to effect a second machining cycle which processes the block along working paths having the same theoretical value of curvature.

4,548,248

HANDLE FOR STRIKING TOOL

Herbert F. Riemann, 182 Guinea Rd., Stamford, Conn. 06903

Filed Feb. 27, 1984, Ser. No. 583,865
Int. Cl.[4] B25G *1/00*
U.S. Cl. 81—22 **9 Claims**



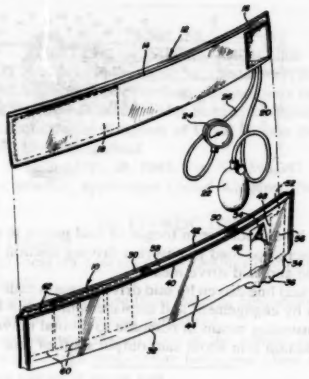
1. A handle for a striking tool comprising a hand-fitting elongate body adapted for supporting an impact head at one end, said handle body having a plurality of transverse finger receiving recesses along a forward face, a rearward face defining thumb positioning means including a longitudinal thumb engageable channel, said handle body further having complementary side faces, each of said faces including an elongate fingertip receiving groove extending longitudinally along the length of the handle body at least a distance corresponding to the finger receiving recesses, said thumb engageable channel and fingertip receiving grooves providing for directional thumb and fingertip control of the handle body during swingable movement of the impact head, said handle body further being grippable at alternate locations along the transverse finger receiving recesses for pivotally swingable movement about a selected finger engaged recess to provide variable power settings.

4,548,249

PROTECTIVE SLEEVE FOR SPHYGMOMANOMETER CUFF

Perry K. Slaughterbeck, Rte. 1, Box 259, Shelley, Id. 83274

Filed Sep. 5, 1984, Ser. No. 647,429
Int. Cl.[4] B65D *65/02*
U.S. Cl. 150—52 R **10 Claims**



1. A protective sleeve for a sphygmomanometer of the type including a flexible, elongated and inflatable strap-type body having inner and outer sides, coacting first and second fastener means on the inner and outer sides of first and second ends, respectively, of the body for adjustably overlappingly and removably securing the opposite ends of said body together to form a closed band of adjusted peripheral size and including a bulb-type air pump and fluid pressure release assembly communicated with the interior of said body by a flexible hose extending therebetween, said sleeve comprising an elongated flexible envelope having an open longitudinal margin and being of a length and width to receive said strap-type body therein, one side of one end portion of said envelope including first means defining a first window opening therein and a first readily removable closure for said opening, the other side of the other end portion of said envelope including second means defining a second window opening therein and a second readily removable closure for said second opening, said strap-type body being removably received in said envelope with said first and second fastener means registered with said first and second window openings, the other longitudinal margin of said envelope including an opening formed therein and an integral flexible tube portion having one end portion anchored relative to said other marginal portion about the last mentioned opening and a second end portion extending outward from said other marginal position, said pump and the adjacent end of said tube being loosely removably received in said tube portion.

4,548,250

APPARATUS FOR OPERATING A LINE DRIVEN DEVICE

Richard D. Meharg, Winfield, and Buckley A. Singletary, Plainfield, both of Ill., assignors to Sears, Roebuck & Co., Chicago, Ill.

Filed Sep. 12, 1983, Ser. No. 530,957
Int. Cl.[4] A47H *1/00*
U.S. Cl. 160—331 **21 Claims**

1. An apparatus for operating a line driven device, comprising:

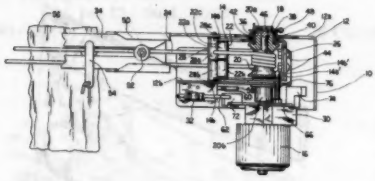
a frame member adapted to be mounted near said device;

a reaction arm pivotally mounted on said frame member;

a motor mounted on said reaction arm and having an output shaft with drive means; a line driven by said drive means; and

tensioning means on said reaction arm in spaced relation to said drive means, said tensioning means being in engagement with said line and adapted for pivotal movement with said reaction arm about said output shaft of said motor in a direction increasing tension on said line, said tensioning means and reaction arm being pivotally displaced by an increase in torque of said motor in response to an increased load to ensure a driving friction between said line and said drive means;

whereby said line driven by said drive means is maintained in tension by engagement and displacement of said line with said tensioning means in response to pivotal movement of said reaction arm about said output shaft of said motor.



4,548,251

METHOD OF PRODUCING SEWING MACHINE NEEDLES

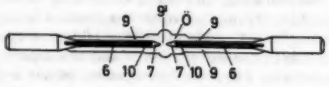
Horst Lange, Aachen, Fed. Rep. of Germany, assignor to Rhein-Nadel Maschinennadel GmbH, Aachen, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,699

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235153

Int. Cl.⁴ B21G *1/04*

U.S. Cl. 163—5 **15 Claims**



1. A method of manufacturing sewing machine needles, each having a needle shank with a point, a needle butt and a section between said shank and said butt, from a cylindrical length of wire constituting two coaxial connected needle blanks being of one-piece which are worked simultaneously such that two of said needles are formed therefrom arranged with points of said two needles facing each other, comprising the steps of

selecting an initial diameter of the length of wire constituting said two coaxial connected needle blanks corresponding to the thickness of the needle butts, respectively of the needles to be manufactured,

working said two coaxial connected needle blanks so as to simultaneously form said two needles therefrom, comprising the steps of

first shaping a central portion of said two blanks, said central portion extending over the length of the needle shanks of said two needles to be manufactured, respectively, from said section of one of said two needles to be manufactured in one of said two needle blanks to said section of the other of said two needles to be manufactured in the other of said two needle blanks, said first shaping of said central portion reducing the diameter of said central portion to a cross section of a smaller diameter than said initial diameter, said first shaping simultaneously initially forming said sections,

secondly further reducing by compression molding said central portion approximately to a final cross-sectional shape of said needle shanks over at least the length of said needle shanks and said sections while pressing thread grooves in the region of the needle shanks from curved outer surfaces of said length of said wire while simultaneously forming the points of said two needles facing each other and relatively small flat fins along said central portion at least at said points and between said points.

4,548,252

CONTROLLED PULSE FRACTURING

Lawrence R. Stowe, Plano, and Warren F. Johnson, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,492

Int. Cl.⁴ E21B *43/263*

U.S. Cl. 166—299 **28 Claims**

1. A method for fracturing a subterranean formation penetrated by at least one well which extends from the surface of the earth to the formation comprising:

(a) placing into a well near the productive interval a means for fracturing the formation by a pressure loading rate sufficient to create multiple fractures;

(b) maintaining the peak pressure load sufficiently above the in-situ stress pressure but below the rock yield stress for a time sufficient to allow fluid penetration and extension of fractures; and

(c) injecting a hydrogen peroxide solution containing a stabilizing agent into the fractures formed, which stabilizing agent reacts with metal values in the formation resulting in a substantial reduction of said agent in the solution, and the resultant substantially unstabilized hydrogen peroxide decomposes to form a gaseous medium which expands and extends the fractures.

4,548,253

METHOD FOR MAKING COMPOSITE MATERIAL OBJECT BY PLASTIC PROCESSING

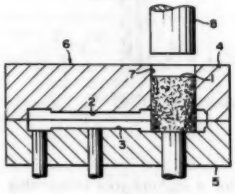
Kiyoshi Funatani; Tadashi Donomoto; Atsuo Tanaka, and Yoshiaki Tatematsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 24, 1983, Ser. No. 525,992

Claims priority, application Japan, Oct. 8, 1982, 57-177049

Int. Cl.⁴ B22D *23/00, 23/06*

U.S. Cl. 164—80 **10 Claims**



1. A method of forming an article of composite material of predetermined shape comprising the steps of:

(a) forming a mass of reinforcing material bound with an inorganic binder;

(b) compounding said reinforcing material mass in a matrix of metal by surrounding said bound reinforcing material with said metal in a molten state and applying pressure thereto, thereby forming a solid billet;

(c) heating said billet to a degree sufficient to melt at least a portion of said matrix such that the percentage of matrix metal in the molten phase is at least 40 percent;

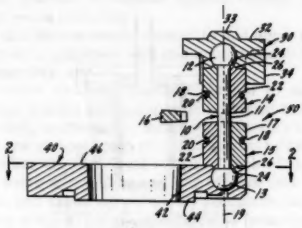
(d) deforming said matrix billet by plastic processing under applied pressure to said predetermined shape; and

(e) allowing said deformed billet to cool.

4,548,254
METHOD OF MANUFACTURING A DIE-CAST WOBBLE PLATE ASSEMBLY

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,700
Int. Cl.⁴ B22D *19/00*
U.S. Cl. 164—112 **5 Claims**



3. A method of manufacturing a swash plate and piston assembly, comprising the steps of:

(a) fabricating a plurality of dumbbell-like connecting rods with spherical ends, each rod having a central rod section of a predetermined overall length and a longitudinal axis, each rod terminating in spherical ends;

(b) mounting a pair of split inserts on each of said connecting rods, each insert defining grooves to receive a holding ring, and each of said inserts encircling said rod and abutting one of said spherical ends;

(c) providing a swash plate and piston die, said die including a central plug member with wedges, a top plate, a bottom plate and side members, which die members cooperate to define a plurality of piston cavities and a swash plate cavity;

(d) positioning said connecting rods in said die such that a spherical end is provided in each of said piston cavities with the opposite spherical end of each rod positioned in said swash plate cavity;

(e) securing said wedges between said rod mounted inserts to retain said inserts against said spherical ends; and

(f) casting a swash plate and plurality of pistons about said spherical ends, which cast swash plate and pistons define sockets about said spherical ends.

4,548,255
MOLD WITH STARTER AND SELECTOR SECTIONS FOR DIRECTIONAL SOLIDIFICATION CASTING

Martin J. Reiner, South Windsor, Conn., and Kenneth E. Taylor, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 353,763, Mar. 1, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,071
Int. Cl.⁴ B22C *9/02*
U.S. Cl. 164—361 **6 Claims**

1. A mold for casting a single crystal article, the mold having an article section and a starter section connected together by a selector section which is smaller in cross sectional area than the connected sections; the sections aligned along a vertical axis; the starter section having a first end subsection connected to the selector section, and an opposing second end subsection having a surface area to volume ratio less than that of the first end subsection.

4,548,256
CASTING OF METAL ARTICLES

Terence G. J. Glinn, Stourmouth, Nr. Canterbury, and Robert J. Deverill, Guildford, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 28, 1983, Ser. No. 546,387
Claims priority, application United Kingdom, Nov. 3, 1982, 8231405
Int. Cl.⁴ B22C *1/00*
U.S. Cl. 164—529 **14 Claims**

1. A process for making metal castings comprising the following steps:

(i) shaping a mold core from material comprising dicalcium silicate as its principal ingredient,

(ii) sintering said shaped core in the temperature range in which the high temperature hexagonal phase of the dicalcium silicate is stable and

(iii) cooling said sintered shaped core at a rate such as to avoid the β to γ phase change; and thereafter

(iv) placing said cooled sintered shaped core within a mold,

(v) pouring molten metal into the cored mold,

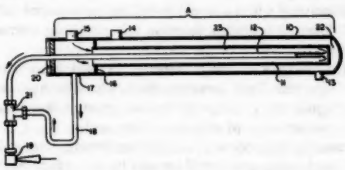
(vi) controlling the cooling of the poured metal so as to cause self disintegration of the mold core during cooling upon reversion of the dicalcium silicate to its ambient temperature phase, and

(vii) separating the metal casting from the mold and from the core remnants.

4,548,257
BAYONET TUBE HEAT EXCHANGER

William R. Williamson, 8310 Pilgrim Rd., Pensacola, Fla. 32504

Continuation of Ser. No. 350,804, Feb. 22, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,760
Int. Cl.⁴ F28B *9/10, 9/08*
U.S. Cl. 165—1 **31 Claims**



1. A method for operating a bayonet tube heat exchanger comprising:

(a) forming a first fluid flow zone between the inner surface of a shell having a closed end and the outer surface of a tubular thin gauge sheath having a closed end, the closed end of the sheath being spaced from the closed end of the shell;

(b) forming a second fluid flow zone between the inner surface of the sheath and the outer surface of a bayonet tube concentrically inserted into said sheath, the inner end of said bayonet tube being open and spaced from the closed end of said sheath, and the outer end of said bayonet tube extending outside said second fluid flow zone;

(c) causing a first fluid to flow through said first fluid flow zone;

(d) causing a second fluid to flow through said second fluid flow zone wherein said second fluid is condensed in heat exchange relation with said first fluid flow zone, said second fluid flow zone including the annulus formed between said bayonet tube and the inner surface of said sheath;

(e) directing said second fluid into said annulus in the direction of said open end of said bayonet tube;

applying a vacuum source to the outer end of said bayonet tube for directing fluid flow in said bayonet tube in the direction opposite that of said second fluid flow in said annulus for removing condensate and non-condensible gases entrained in said second fluid from said annulus to said vacuum source; and

(g) removing condensate from said second fluid flow zone.

4,548,258

METHOD AND MEANS FOR INHIBITING CORROSION IN A HEAT PIPE

John A. Nelson, Benton Township, Berrien County, and Joan D. Banks, Oronoko Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 2, 1984, Ser. No. 627,345
Int. Cl.⁴ F28F *19/02*
U.S. Cl. 165—1 **27 Claims**

18. The method of preventing corrosion of the inner surface of a sealed enclosure defining a heat pipe by an aqueous heat transfer liquid in said enclosure, comprising:

dissolving a first corrosion-inhibiting material in the liquid to form an inhibitor solution for inhibiting corrosion of said inner surface of the enclosure;

dissolving a coating material in said heat transfer liquid selected from coating materials which dissolve in the liquid at a temperature no greater than the operating temperature of said heat pipe; and

causing deposition of a layer consisting essentially solely of said coating material on said inner surface of the heat pipe to define corrosion-inhibiting means thereon effectively preventing corrosion of said inner surface by said aqueous liquid said operating temperature.

4,548,259

LIQUID CONTAINING VESSEL WITH TEMPERATURE CONTROL DEVICE

Sadao Tezuka, Tokyo; Yasuhiko Tanaka, Yono; Kunihiko Matsumura, Tokyo; Tadao Yamamoto, Machida; Nobuyoshi Suzuki, Hachioji, and Toshio Tsurukawa, Machida, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

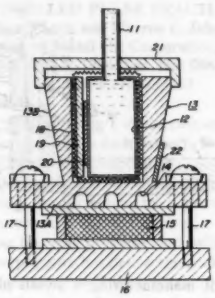
Filed Oct. 7, 1982, Ser. No. 433,263
Claims priority, application Japan, Oct. 9, 1981, 56-160314; Oct. 9, 1981, 56-160315; Oct. 9, 1981, 56-160316
Int. Cl.⁴ F25B *29/00, 21/02*
U.S. Cl. 165—14 **26 Claims**

1. A vessel for containing a liquid to be chemically analyzed and for maintaining the liquid at a predetermined temperature comprising:

means for containing a liquid;

heating means substantially fully surrounding said containing means for heating the liquid;

an isothermal frame surrounding said heating means and having a large heat capacity, said isothermal frame comprising a bottom, side walls integrally formed with the bottom, the sidewalls increasing in thickness from the bottom to upper portions thereof, and a cover detachably provided on the upper portions of the side walls;



a cooling source comprising a Peltier element connected to an outer surface of the bottom of said isothermal frame; and

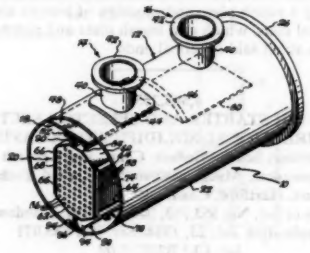
means for detecting a temperature of the liquid.

4,548,260

HEAT EXCHANGER

Victor J. Stachura, E. Amherst, N.Y., assignor to American Precision Industries, Inc., Buffalo, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,521
Int. Cl.⁴ F28D *7/00*
U.S. Cl. 165—78 **6 Claims**



1. A heat exchanger comprising:

a closed longitudinally extending shell having top and bottom walls and spaced apart fluid inlet and outlet ports in said top wall;

dividing means disposed within said shell, said dividing means including a longitudinally extending plate assembly spaced away from the top wall;

a longitudinally extending tube bundle disposed between the plate assembly and the bottom wall of the shell, said tube bundle including a plurality of longitudinally extending tubes and opposed upper and lower longitudinally extending shrouds, each having first and second longitudinally extending peripheral edges and a center line between the edges, there being an inlet to the tube bundle between the first peripheral edges of the upper and lower shrouds and

an outlet to the tube bundle between the second peripheral edges of the upper and lower shrouds;

upper and lower longitudinally extending mounting brackets secured to the upper and lower shrouds adjacent their center lines, respectively, the mounting brackets extending away from said shrouds at generally right angles thereto;

supporting means for supporting the tube bundle within the shell for assembly movement relative thereto, said supporting means including

an upper stabilizer assembly secured to said upper mounting bracket and engageable with said longitudinally extending plate assembly, and

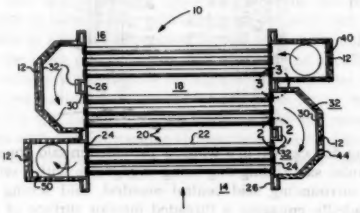
a lower roller and seal assembly secured to said lower mounting bracket and engageable with said bottom wall of the shell, said assembly including a plurality of longitudinally spaced apart pairs of rollers carried by said mounting bracket, the individual rollers of each of said pair of rollers being disposed on opposite sides of said mounting bracket, and extending outwardly therefrom, and a longitudinally extending seal carried by said mounting bracket and disposed between the rollers of each pair and extending outwardly therefrom.

4,548,261

PLURALITY OF TUBULAR HEAT EXCHANGER MODULES

Michael A. Case, Scio; Glenn D. Mattison, and Wayne S. Counterman, both of Wellsville, all of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed May 11, 1984, Ser. No. 609,397
Int. Cl.[4] F28F 9/22, 9/26
U.S. Cl. 165—82 **1 Claim**



1. A tubular heat exchanger including:

a. a housing having opposing ends, said housing having a first opening at the one end thereof and a second opening at the other end thereof and defining therebetween a chamber through which a vertical flow of a first fluid passes between the first and second openings in said housing;

b. a plurality of heat exchange modules disposed within said housing in a spaced vertical array, each module comprising a pair of laterally spaced tube sheets with aligned apertures therein and a plurality of longitudinally disposed heat exchange tubes extending between the aligned apertures in the spaced apart tube sheets;

c. a plurality of support beams disposed so as to extend transversely across and between the spaced heat exchange modules such that the tube sheets of each module have a lower lateral edge slidably abutting against a subadjacent support beam and an upper lateral edge slidably abutting against a superadjacent support beam;

d. inlet means to said housing for a second fluid at one end thereof and outlet means to said housing for the second fluid at the opposite end thereof, the inlet means and outlet means opening to the tubes of the upper-most heat exchange module and to the tubes of the lower-most heat exchange module; and

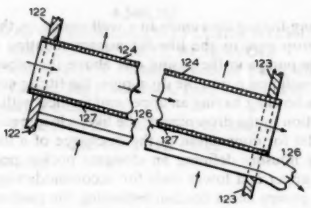
e. header conduits interconnecting the lateral ends of vertically adjacent heat exchange modules to permit the second fluid to flow from the inlet means to the outlet means along a serpentine flow path through the tubes of one module and thence through the tubes of the next adjacent module in heat exchange relationship with the first fluid flowing through said housing, each header conduit comprising a substantially U-shaped open-ended duct rigidly attached to the tube sheets of the adjacent heat exchange modules that it interconnects and spaced from said housing and the support beams that it neighbors so as to provide a gap on each side of the header conduit into which the header conduit may contract or expand longitudinally as the tube sheets to which it is attached slide across the support beams which they abut.

4,548,262

CONDENSING GAS-TO-GAS HEAT EXCHANGER

Francis R. Hull, 23-03 45th Rd., Long Island City, N.Y. 11101

Continuation-in-part of Ser. No. 480,930, Mar. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 237,909, Feb. 25, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 654,236
Int. Cl.[4] F28B 9/08
U.S. Cl. 165—111 **18 Claims**



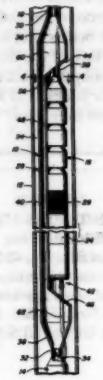
1. A condensing heat exchanger for transferring heat between a gaseous fluid having condensable fractions and a second cooler fluid, comprising in combination: an outer shell enclosure for confining the first gaseous fluid; conduit means communicating with the said outer sheli enclosure for admitting the first gaseous fluid; conduit means communicating with the said outer shell enclosure for discharging the first gaseous fluid; a plurality of vertically spaced heat transfer conduit means having vertical centerplanes and transverse centerplanes perpendicular thereto disposed and horizontally declined within the said outer shell enclosure for confining flow of the second cooler fluid through the said condensing heat exchanger; inlet and outlet conduit means communicating with the said horizontally-declined heat transfer conduit means for confining flow of the second cooler fluid into and out of the said condensing heat exchanger; absorbent drainage conduit means whose upper portion is disposed lengthwise adjacent the outer surface of each of the said horizontally-declined heat transfer conduit means below the transverse centerplane which is perpendicular to the vertical centerplane thereof, while the lower portion of each of the said absorbent drainage conduit means extends as an appendage below all of the said horizontally-declined heat transfer conduit means; whereby condensate from fractions of the first gaseous fluid which drains downwardly across the outer surface of the said horizontally-declined heat transfer conduit means is absorbed into the said absorbent drainage conduit means and confined within the said absorbent drainage conduit means by capillary action, while the condensate is impelled by hydrostatic pressure to flow downwardly through interstitial passageways of the said absorbent drainage conduit means to a lower point below all of the said horizontally-declined heat transfer conduit means.

4,548,263

FITTING FOR DUAL SUBMERSIBLE PUMPS

Billy E. Woods, 11661 Alta Mesa Rd., Galt, Calif. 95632

Filed Mar. 14, 1984, Ser. No. 589,356
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—105 **6 Claims**



1. A fitting for use downhole in a well casing on the bottom end of a drop pipe or the like for accommodating a pair of submersible pumps in the casing one above the other for discharge of each pump into the drop pipe, the fitting comprising an elongate housing having an upper end formed with an outlet for connection to the drop pipe or the like, a lower end formed with an inlet for connection to the discharge of a first of the pumps, the housing defining an elongate pocket portion between the upper and lower ends for accommodating the second of the pumps and a conduit bypassing the pocket portion for delivery of fluid from the inlet to the outlet, the housing having a further inlet for connection to the discharge of the second pump, the further inlet being located at the upper end of the pocket portion, wherein the housing comprises a central section between the respective ends including a part-cylindrical outer wall, the pocket portion being defined by a concave longitudinal wall having edges merging with the respective edges of the outer wall whereby said conduit is provided with a portion of crescent shaped cross section, and inclined upper and lower end walls of part-elliptical shape connected between the longitudinal wall and the outer wall, the upper end plate being inclined upwardly from a connection with the longitudinal wall to a connection with the outer wall and the lower end plate being inclined downwardly from a connection with the longitudinal wall to a connection with the outer wall, the further inlet being formed in the upper end wall and the central section of the fitting being connected to the respective ends of the fitting by symmetrical bell-like frusto-conical portions.

4,548,264

HIGH TEMPERATURE WELL PACKER

Phillip H. Manderscheid, Cypress, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 10, 1984, Ser. No. 598,653
Int. Cl.[4] E21B *33/128, 33/129*
U.S. Cl. 166—139 **3 Claims**

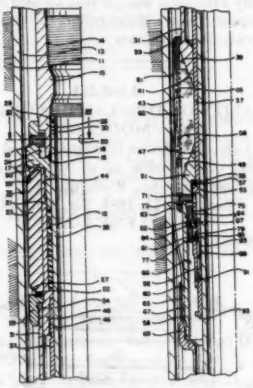
1. A well packer adapted to be releasably set internally in a well bore, comprising:

a central mandrel both slidably and rotatably received within an outer assembly, said outer assembly including a top body with an interior bore of a greater diameter than and circumscribing said central mandrel, said central mandrel having an external flange region about a portion of the circumference thereof for contacting abutment means within said top body bore when said mandrel is rotated within said body to transmit torque to said outer assembly;

seal means, as a part of said outer assembly, movable radially outwardly between a retracted configuration and an extended configuration in which said seal means sealingly engage said well bore;

anchoring means, including an upper cone with a slip engaging end, an oppositely arranged lower cone with a slip engaging end, and slip means intermediate said cones within said outer assembly, said slip means having lower tapered surfaces for contacting said slip engaging ends for moving said slip means between a retracted position and an extended gripping position in which said slip means grippingly engage said well bore;

a connecting tube depending from said top body and surrounding a portion of said central mandrel, said upper cone, lower cone and slip means being slidably received about said connecting tube;



a sliding dog carried in a window provided in said connecting tube, said sliding dog being engageable with a setting nut surrounding said central mandrel, said setting nut threadedly engaging a threaded interior surface of said lower cone whereby rotation of said central mandrel transmits torque through said top body, connecting tube, sliding dog and setting nut to propel said lower cone axially for moving said seal means to said extended configuration and for moving ssid slip means into said extended gripping position; and

a support sleeve carried about said central mandrel and connected by frangible means to a lower end of said connecting tube, said support sleeve having a region of increased diameter underlying said sliding dog and a region of decreased diameter, whereby axial movement of said support sleeve releases said dog from engagement with said setting nut to retract said seal means and slip means to release said packer.

4,548,265

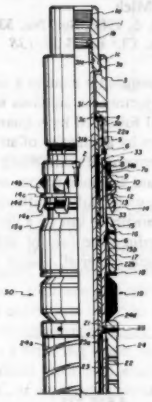
DOWNHOLE STEAM PACKING

Mike A. Luke, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 15, 1983, Ser. No. 514,013
Int. Cl.[4] E21B *33/128*
U.S. Cl. 166—140 **39 Claims**

1. Packing apparatus for use on a subterranean well tool for sealing the annulus between inner and outer conduits in the presence of steam in a well, the packing apparatus comprising: a plurality of separate annular nonresilient packing elements, further comprising nonresilient fibrous elements and nonresilient bridging material disposed among the fibrous elements, the

packing elements being initially disposed in adjacent relationship within an annular encapsulating jacket, said annular encapsulating jacket being disintegratable in the presence of steam in the well; at least one opposing packing element having a radially extending surface inclined relative to the axis of the packing apparatus with the base being wider than the outer periphery, and a plurality of other packing elements having parallel sides and being aligned side-by-side with the inclined surface of said one packing element and being inclined relative



to the axis of the packing apparatus, whereby the packing apparatus in surrounding relationship to the well tool, when subjected to axially compressive forces, seals the annulus between the inner and outer conduits, the inclined packing elements being pivoted radially outward without resilient expansion when subjected to axially compressive forces to shift outwardly and establish sealing integrity with the outer conduit and with said one packing element being wedged inwardly to establish sealing integrity with the inner tubular member.

4,548,266

METHOD FOR ISOLATING TWO AQUIFERS IN A SINGLE BOREHOLE

Patrick W. Burklund, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,346
Int. Cl.[4] E21B *33/13, 47/06, 49/08*
U.S. Cl. 166—250 **15 Claims**

1. A method for individually instrumenting at least a pair of aquifers separated by a confining bed, comprising the steps of:

drilling a borehole from the ground surface through an upper of the pair of aquifers and into the confining bed;

emplacing in the borehole a casing having two separatable sections;

grouting the borehole in the vicinity of and within a lower of said two separatable casing sections;

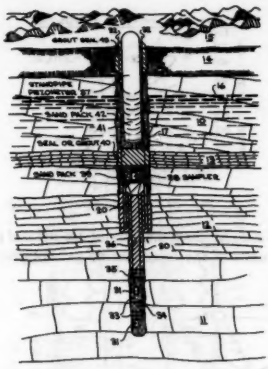
boring a hole through the grout and through the remainder of the confining bed into the lower of the pair of aquifers;

providing a lower section of the borehole in the area of the lower aquifer with instrumentation having signal transmitting and sampling means extending to the ground surface;

grouting a portion of the borehole above the instrumentation up to an upper portion of the lower of said two separatable casing sections;

removing the upper of the two separatable casings from the borehole; and

providing at least a section of the borehole adjacent the upper of the pair of aquifers with instrumentation having



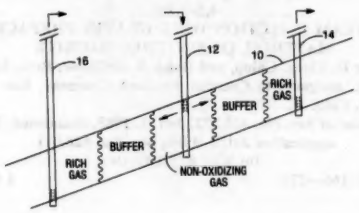
signal transmitting and sampling means extending to the ground surface.

4,548,267

METHOD OF DISPLACING FLUIDS WITHIN A GAS-CONDENSATE RESERVOIR

Miller Sheffield; Robert S. Metcalfe, both of Tulsa, Okla., and James W. Calvin, The Woodlands, Tex., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 29, 1983, Ser. No. 556,205
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—268 **8 Claims**



1. A method of displacing reservoir fluids through a subterranean retrograde or gas condensate reservoir, comprising:

introducing a displacement fluid into the reservoir and displacing it and the reservoir fluids through the reservoir, wherein the displacement fluid develops in situ miscibility with the reservoir fluids at the temperature and pressure of the reservoir and further wherein the displacement fluid comprises a nonoxidizing gas selected from the group consisting of carbon dioxide, flue gas, nitrogen, and mixtures thereof and fluids produced from the reservoir.

4,548,268

METHOD FOR OIL RECOVERY USING A POLYMER CONTAINING FLUID

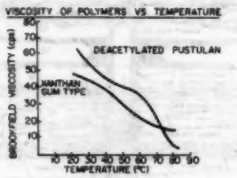
Arthur J. Stipanovic, Wappingers Falls, N.Y., assignor to Texaco, Inc., White Plains, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,119
Int. Cl.[4] E21B *33/138, 43/22*
U.S. Cl. 166—270 **15 Claims**

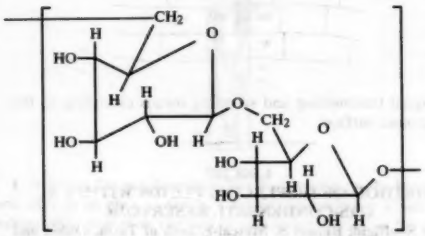
1. A process for recovering hydrocarbons from a subterranean hydrocarbon bearing formation penetrated by an injection well and a production well which comprises:

(a) injecting into the formation via said injection well an

aqueous drive fluid comprising water and more than about 200 ppm of a Beta-(1→6)-D-glucan having an average



molecular weight more than about 2×10^6 and comprising recurring units of the disaccharide gentiobiose:



(b) forcing said aqueous drive fluid through the formation; and

(c) recovering hydrocarbons from said production well.

4,548,269

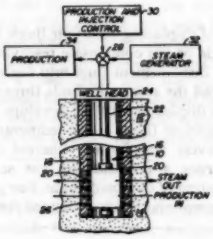
STEAM INJECTION WELL GRAVEL PREPACK MATERIAL OF SINTERED BAUXITE

Thomas D. Elson, Chino, and Ralph S. Millhone, Brea, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 455,372, Jan. 3, 1983, abandoned. This application Jul. 5, 1984, Ser. No. 628,011

Int. Cl.⁴ E21B *43/04*

U.S. Cl. 166—276 **1 Claim**



1. A method for reducing particulate material pack dissolution in a subsurface, steam injection or production wellbore comprising the steps of:

(a) providing a prepack well element comprising an inner liner, an outer liner establishing a hollow cylinder like annulus, a pack material consisting essentially of sintered bauxite solidly packed in said annulus without a binding material to establish a porous, permeable path between said inner liner and said outer liner;

(b) introducing the prepack well element into the steam injection or production wellbore; and

(c) passing hot well fluids including steam through the prepack well element.

4,548,270

PROCESS FOR PLUGGING A SUBTERRANEAN FORMATION

Louis H. Eilers, Inola, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1983, Ser. No. 539,518

Int. Cl.⁴ E21B *33/138*

U.S. Cl. 166—291 **14 Claims**

1. In a process for plugging a zone in a subterranean formation by sequentially injecting an aqueous solution of a water soluble silicate material followed by a quantity of an aqueous spacer material and then by a quantity of an aqueous hydraulic cement slurry, the improvement comprising incorporating into said silicate solution, said aqueous spacer material or said hydraulic cement slurry a water soluble, dibasic or tribasic alkali metal or ammonium phosphate salt or a mixture thereof in an amount sufficient to reduce the rate of gel formation which occurs when said silicate material, spacer and hydraulic cement are intermingled.

4,548,271

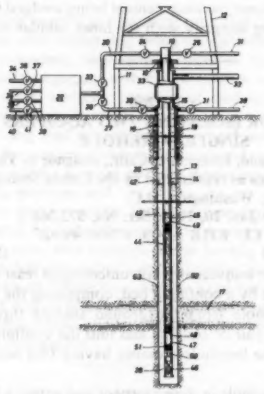
OSCILLATORY FLOW METHOD FOR IMPROVED WELL CEMENTING

Stuart R. Keller, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 7, 1983, Ser. No. 540,065

Int. Cl.⁴ E21B *33/16*

U.S. Cl. 166—291 **13 Claims**



1. A method of cementing a wellbore having a casing extending longitudinally therein which provides an annulus between said casing and the wall of said wellbore, said method comprising:

(a) introducing a fluid into said annulus;

(b) causing said fluid to flow in said annulus;

(c) changing the direction of flow of said fluid at least twice;

(d) introducing a cement slurry into at least an interval of said annulus, thereby displacing said fluid from said interval; and

(e) allowing said cement slurry to set.

4,548,272

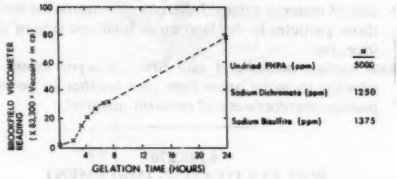
OIL RECOVERY PROCESS USING A POLYMER GEL

Charles J. Norton; David O. Falk, both of Denver, Colo., and Alfred D. Hill, Austin, Tex., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 337,570, Jan. 7, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,189

Int. Cl.⁴ E21B *33/138;* E02D *3/12*

U.S. Cl. 166—295 **10 Claims**



1. A process for controlling the permeability of a porous matrix comprising the steps of:

adding an undried partially hydrolyzed polyacrylamide and an oxidizing agent, selected from the group consisting of alkali metal and ammounium salts of hexavalent chromium ions and chromium trioxide, at predetermined concentrations to an aqueous medium;

thereafter adding a reducing agent, selected from the group consisting of alkali metal and ammonium salts of sulfur-containing ions, at a predetermined concentration to said aqueous medium to produce a gel-forming mixture;

adjusting the pH of said mixture above about 7 to delay the gelation rate of said gel-forming mixture;

applying said gel-forming mixture to said porous matrix; and

reacting said gel-forming mixture in situ at a pH below about 7 to produce a permeability controlling gel, wherein the degree of permeability control is directly proportional to the amount of said mixture applied to said matrix and the concentration of said polyacrylamide and oxidizing and reducing agents in said mixture.

4,548,273

TORQUE MULTIPLIER SUBSEA TOOL

Frederick M. Leicht; Benton F. Baugh, and Harish C. Palany, all of Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 22, 1983, Ser. No. 554,208

Int. Cl.⁴ E21B *23/06, 33/043*

U.S. Cl. 166—348 **27 Claims**

1. A tool for running a casing hanger and a sealing assembly including a sealing member on a drill string into a subsea wellhead, and for setting the sealing member in the annulus between the casing hanger and a surrounding tubular member, comprising:

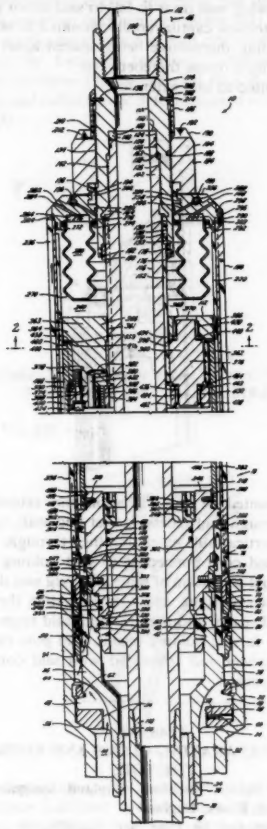
means for releasably attaching the casing hanger and the sealing assembly to the tool;

mandrel means adapted for connecting the tool to the drill string and for receiving an input torque from the drill string;

multiplying means cooperable with said receiving means for multiplying the input torque into an increased output torque;

means cooperable with said multiplying means for transmitting the increased output torque to the sealing assembly for advancing the sealing assembly axially in the annulus to set the sealing member; and

first means disposed on said mandrel means for automatically releasing said releasably attaching means for disengaging the tool from the casing hanger upon a predetermined axial movement of a portion of the sealing assembly



in setting the sealing member, whereby the tool may be lifted up and removed to the surface.

4,548,274

AUTOMATICALLY OPENING DECORATIVE FIRE EXTINGUISHER COVER

Timothy J. Simpson, 625 Meadowview Dr., Greenwood, Ind. 46142

Filed Nov. 7, 1983, Ser. No. 548,958

Int. Cl.⁴ A62C *25/00*

U.S. Cl. 169—51 **4 Claims**

1. A combination clock and fire extinguisher apparatus comprising:

a housing mountable to a wall and having a cavity with a vertical opening sized to receive and hold a fire extinguisher;

a fire extinguisher positioned within said cavity but removable therefrom;

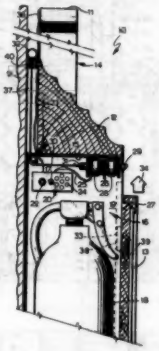
a door slidably mounted to said housing adjacent said vertical opening and movable by the force of gravity from an up position closing said cavity to a down position opening said cavity and revealing said fire extinguisher;

detection means operable to detect fire and to then produce a signal;

holding means on said housing operable to hold said door in said up position and to release same upon receipt of said signal allowing said door to fall to said down position;

a housing extension cantileveredly mounted to said housing and extending thereabove being spaced apart from said wall forming a recess therebetween;

a clock mounted to said extension;



a spacer mounted to said extension and extending rearwardly through said recess against said wall, said spacer having a vertical hole extending therethrough;

a pull ring and cord connected to said holding means to allow manual activation of same allowing said door to fall to said down position, said cord extending through said hole of said spacer and then through said recess and into said cavity to said holding means, said pole ring resting atop said spacer and concealed with said cord by said housing extension.

4,548,275

DEVICE FOR SEPARATING CLODS AND STONE FROM THE SOIL

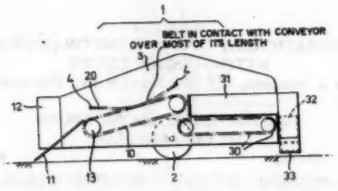
William H. R. Squier, Rochford, England, assignor to A W Squier Limited, Essex, England

Filed Apr. 19, 1983, Ser. No. 486,545

Claims priority, application United Kingdom, Apr. 19, 1982, 8211307

Int. Cl.⁴ A01B *43/00*

U.S. Cl. 171—14 **8 Claims**



1. A device for separating clods and stones from the soil, said device comprising:

a frame adapted to be drawn or carried across the land;

a first conveyor means on said frame;

at least one means carried by said frame for raising the surface layer of soil material from the land and passing it to said first conveyor means;

said first conveyor means having apertures therethrough to permit material on said first conveyor means to pass therethrough and to be returned to the land;

a substantially static surface means disposed above said first conveyor means for bearing against material on said first conveyor means so as to crush and abrade material on said first conveyor means and thereby reduce its particle size to permit it to pass through said apertures in said first conveyor means;

said surface means extending over and being in contact with at least 60% of the length of said first conveyor means;

said first conveyor means being adapted to discharge particles of material retained thereon to a means for returning those particles to the land on at least one side of the device; and

said surface means and said first conveyor means being adapted to move apart from one another to permit the passage therebetween of resistant material.

4,548,276

SOIL CULTIVATING IMPLEMENT

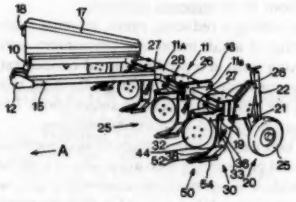
Barry A. Linger, Harleston, England, assignor to Howard Machinery Public Limited Company, Harleston, England

Filed Aug. 1, 1983, Ser. No. 518,971

Claims priority, application United Kingdom, Nov. 8, 1982, 8223106

Int. Cl.⁴ A01B *13/08*

U.S. Cl. 172—166 **10 Claims**



1. A cultivating implement comprising a frame, at least one soil working tool mounted on the frame, and a rotatable disc mounted on the frame and arranged for forming a slot in the soil in advance of the soil working tool, the tool including a blade having an inclined portion which in operation extends downwardly into the soil in a plane substantially parallel to its direction of travel through the soil, said portion passing edgewise through the soil in operation and being inclined at an acute angle to the vertical so as to lift the soil lying above the inclined blade portion, the blade also having an upper, generally upright portion, the inclined portion extending at a greater angle to the vertical than said upper portion, and an intermediate transitional region of the blade between said upper portion and said inclined portion, which intermediate region is located in use below the level of the surface of the ground with which the tool is engaged in use, the blade terminating at the lowermost end of the inclined portion, and the disc being mounted in a substantially upright position for rotation about a substantially horizontal axis so that the upper portion of the blade enters the slot formed by the disc.

4,548,277

SPRING RESET MECHANISM FOR TILLAGE TOOL

William J. Dietrich, Sr., Congerville, and Cary L. Sizelove, Eureka, both of Ill., assignors to DMI, Inc., Goodfield, Ill.

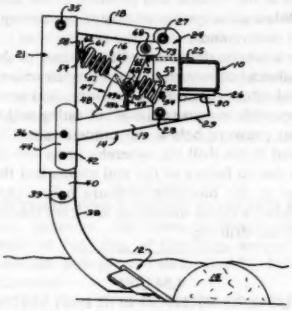
Filed Oct. 13, 1983, Ser. No. 541,529

Int. Cl.⁴ A01B *61/04*

U.S. Cl. 172—265 **7 Claims**

1. In a spring reset mechanism for a ground-engaging tool carried by an implement frame and including linkage means for mounting said tool to said frame and for moving said tool between a normal use position and an elevated clearance position, the improvement comprising: said linkage means includ-

ing an upright forward link member mounted to said frame, generally horizontal lower and upper links pivotally mounted to said forward link member at respective lower and upper locations, and an upright rear support link member carrying said tool and pivotally mounted to the rear portions of said lower and upper links; a cam member defining a cam surface; means for fixedly mounting said cam member to one link of said linkage means; guide link means pivotally mounted to



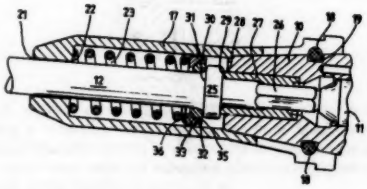
another of said links of said linkage means and including a roller; and spring means for biasing said guide link such that said roller is urged into contact with said cam surface; said linkage means, mounting means, cam surface and guide link means being constructed and cooperatively arranged to continuously reduce the rate of compression of said spring means and continuously to move said roller along said cam surface to reduce the resistance moment arm of said reset mechanism as said tool is raised from the normal use position.

4,548,278

PERCUSSION TOOL

Per A. L. Gidlund, Täby, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jan. 23, 1984, Ser. No. 572,764
Claims priority, application Sweden, Jan. 24, 1983, 8300340
Int. Cl.[4] B23B *45/16*; B25D *3/00*
U.S. Cl. 173—121 **4 Claims**



1. In a percussion tool comprising a housing (10, 17), a hammer piston (11) reciprocably powered in the housing (10,17), a front opening (21) in the housing (10, 17) for receiving the rear end portion of a working implement (12), a forwardly facing shoulder (28) in the housing (10, 17) arranged to be abutted by a rearwardly facing shoulder (29) on the working implement (12) and to define an axial rest position for the working implement (12) relative to the housing (10, 17), and an energy absorbing bias unit arranged between a rearwardly facing shoulder (22) on the housing (10, 17) and a forwardly facing shoulder (30) on the working implement (12), said energy absorbing bias unit comprising a spring (23) for resiliently loading the working implement (12) toward said rest position, the improvement wherein:

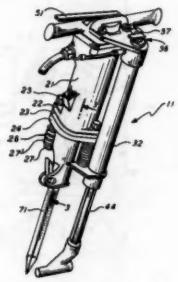
said energy absorbing bias unit further comprises a shock wave mitigating pair of ring elements (32, 33) interposed between said spring (23) and said forwardly facing shoulder (30) on said working implement (12), said ring elements (32, 33) having mating substantially conical contact surfaces (35, 36), whereby a portion of the impact energy received by said energy absorbing bias unit during each impact stroke of said hammer piston (11) is absorbed by radial elastic deformation of said ring elements (32,33) as well as by frictional resistance between said mating contact surfaces (35, 36) of said ring elements (32, 33) during said radial elastic deformation of said ring elements (32, 33).

4,548,279

TOOL EXTRACTOR

Wenzel Zaruba, 20 Battleridge Trail, Totowa, N.J. 07512

Filed Jul. 29, 1983, Ser. No. 518,694
Int. Cl.[4] B27C *3/08*
U.S. Cl. 173—170 **9 Claims**



1. In a demolition tool of the type in which compressed air or other force is utilized to cause a chisel or cutting device to enter a working surface with an extraction device mounted on the demolition tool to aid in removal of the chisel from the working surface comprising a pneumatic piston cylinder and rod,

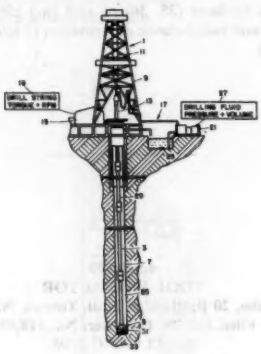
the improvement which comprises means for supplying a continual source of compressed air to the pneumatic piston cylinder, means for selectively allowing the compressed air to enter the extractor piston cylinder to maintain the rod in contact with the work surface, means for controlling the incoming flow of compressed air to the pneumatic piston cylinder to force the rod against the work surface and extracting the chisel from the work surface, means for allowing air to be released from the pneumatic piston cylinder to allow the chisel to enter the working surface while the rod maintains contact with the working surface, and wherein the upper portion of the extractor piston-cylinder is slidably mounted in a cylindrical extension from the top of the demolition tool, the lower portion of the extractor cylinder is mounted to a second cylindrical extension at the lower end of the demolition tool in a vibration insulating manner, and a clamp portion of the demolition tool secures the extractor cylinder demountably attached in an adjusted position by the use of a keyway cut in the extractor cylinder with a fastener for the clamp acting as the key.

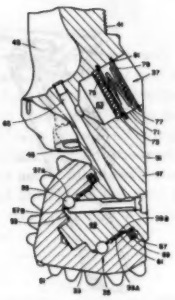
4,548,280

DRILL BIT HAVING A FAILURE INDICATOR

Jeffery E. Daly, and Paul E. Pastusek, both of Houston, Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Filed Feb. 15, 1984, Ser. No. 580,502
Int. Cl.⁴ E21B *10/22*
U.S. Cl. 175—40 **16 Claims**





1. Drill bit means for use in drilling a well bore comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to a drill string suspended from a drill rig for rotating the drill bit means, a chamber therein adapted to receive drilling fluid at a high first pressure from the drill string, at least one nozzle at the lower end thereof in flow communication with the chamber for exit of the drilling fluid from the bit body to the space between the bit body and the well bore, the drilling fluid in said space being at a low second pressure lower than the high first pressure, and at least one depending leg at the lower end thereof having a generally cylindrical bearing journal;

a roller cutter of generally conical shape having a recess therein of generally circular section for receiving the bearing journal;

bearing means for rotatably mounting the roller cutter on the bearing journal;

a lubrication system for providing lubricant to the bearing means comprising a variable volume reservoir holding a supply of lubricant, passaging extending from the reservoir to the bearing means for flow of lubrucant to the bearing means, seal means between the roller cutter and the journal for blocking flow of lubricant out of the drill bit means, means for pressurizing the lubricant to an intermediate third pressure greater than said low second pressure but less than said high first pressure, and a diaphragm secured in a recess in the exterior of the bit body in fluid communication at one side thereof, constituting its outer side, with the drilling fluid in said space between the bit body and the well bore and at the other side thereof, constituting its inner side, with the lubricant, said diaphragm having biasing means associated therewith for holding it in equilibrium between said intermediate third pressure of the lubricant and said low second pressure of the drilling fluid while allowing the diaphragm to extend and contract within a range of movement in response to changes in the volume and pressure of the lubricant held in the lubrication system as may occur during use of the drill bit means; and

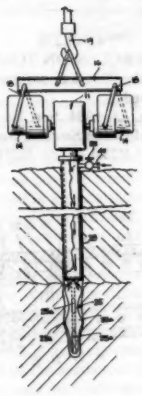
means for sensing a decrease in the pressure of the lubricant in the lubrication system below a predetermined level less than said intermediate third pressure, said sensing means being operable to cause a signal indicating said decrease of lubricant pressure below the predetermined level to be generated at the drill rig, whereby upon loss of lubricant such as due to failure of the seal means and the resultant decrease in the lubricant pressure below the predetermined level, a signal indicating lubricant loss will be provided at the drill rig.

4,548,281

APPARATUS AND METHOD FOR INSTALLING WELL CASINGS IN THE GROUND EMPLOYING RESONANT SONIC ENERGY IN CONJUNCTION WITH HYDRAULIC PULSATING JET ACTION

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 348,880, Feb. 16, 1982, Pat. No. 4,471,838. This application Apr. 13, 1984, Ser. No. 599,969
Int. Cl.⁴ E21B *7/18, 7/20, 7/24*
U.S. Cl. 175—55 **14 Claims**



1. A method for installing a casing in an earthen formation comprising

installing a plug member on the bottom end of said casing to be driven into the formation, said plug member having jet nozzles formed therein,

generating sonic energy by means of an orbiting mass oscillator,

feeding liquid into the casing to establish a pressure head against said plug member, and

applying said sonic energy to the casing to cause vibration thereof such that the liquid is driven from said jet nozzles in pulses in response to the sonic vibration of said casing and said plug members while the casing is vibratorily driven against the formation such that the liquid jet action and vibration of said casing against the formation simultaneously erode said formation ahead of said casing.

6. A system for installing a well casing in an earthen formation comprising

a plug member attached to one end of said casing and forming a cover for said one end, said plug member having a plurality of jet nozzles formed therein, said one end of said casing being placed against the formation for penetration therein,

means for generating vibrational energy at a sonic frequency,

means for feeding liquid into said casing to form a fluid pressure head against said plug member so as to cause the emission of said liquid from said nozzles and

means for coupling said sonic energy to said casing and plug member to effect vibration thereof and from said casing and plug member to the liquid within said casing thereby to erode away the formation ahead of the casing.

4,548,282

METHOD FOR SINKING BOREHOLES

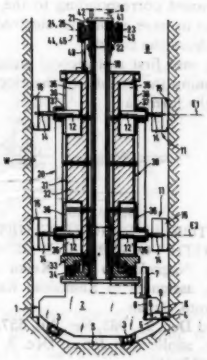
Georg Hurtz, Erkelenz, and Heinz P. Vogts, Hückelhoven-Rurich, both of Fed. Rep. of Germany, assignors to Wirth Maschinen-Und Bohrgerate-Fabrik GmbH, Erkelenz, Fed. Rep. of Germany

Filed May 17, 1983, Ser. No. 495,501

Claims priority, application Fed. Rep. of Germany, May 22, 1982, 3219362

Int. Cl.⁴ E21B *7/10*

U.S. Cl. 175—61 **4 Claims**



1. A method of sinking a substantially vertical borehole utilizing a rotatable variable diameter bore head suspended from and rotatably driven by a borehole drilling device including a set of bore rods and clamping elements engageable with the wall of the borehole, comprising:

determining the desired direction of the borehole;

clamping said device in the borehole;

setting the diameter of the bore head to a first diameter;

boring a section of the borehole by rotatably driving and moving the bore head;

discontinuing said boring step;

reducing the diameter of the bore head;

releasing said clamping;

moving the bore head in a stationary state into a position wherein it is substantially freely suspended in the borehole determining the direction of the next section of the borehole;

clamping said device in the borehole while maintaining substantially the position of the bore head relative to the borehole when in said suspended state;

resetting the bore head to a desired second diameter for boring the next section of the borehole; and

boring the next section of the borehole by rotatably driving and moving the bore head.

4,548,283

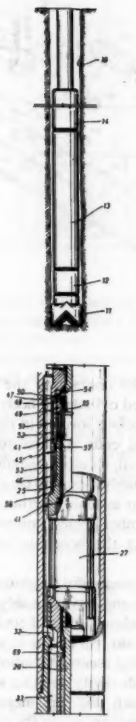
ROTATING SHAFT SEAL AND BEARING LUBRICATING APPARATUS

David E. Young, 303 South Shadowbend, Friendswood, Tex. 77546

Filed Jan. 12, 1981, Ser. No. 224,445

Int. Cl.⁴ E21B *4/02*

U.S. Cl. 175—107 **20 Claims**



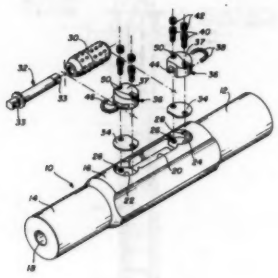
1. Apparatus adapted for use in a conventional downhole drilling environment wherein a drill string in a borehole includes a drilling motor which drives a drill bit on the end of the drill string by means of power provided by the circulation of drilling fluid pumped from the earth's surface down through the drill string and motor, through the nozzles or jets in the drill bit, then back up to the surface through the annular space between the borehole wall and the drill string, comprising: first and second members that are rotatable relative to one another; structural means between said members adapted to operate in a lubricated environment; chamber means containing a lubricant for lubricating said structural means; means for subjecting said lubricant to the direct pressure of fluids in the drill string, said pressure being exterted in an upward direction against the force of gravity; and centrifugal separator means operable in response to rotation of one of said members for separating and trapping solid particles contained in said fluids to thereby substantially prevent contamination of said lubricant by such solid particles, said centrifugal separator means being located downstream of said subjecting means.

4,548,284

ROLLER BALL RETENTION OF REAMER CUTTER ASSEMBLY

Calvin W. Shinn, and Robert G. Terry, both of Odessa, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1983, Ser. No. 546,754
Int. Cl.⁴ E21B *10/30*
U.S. Cl. 175—346 **7 Claims**



1. A drilling tool for contacting the walls of a borehole comprising an elongated cylindrical body having a plurality of generally elongated pockets formed in the surface thereof and terminating at opposed ends in outwardly open sockets circumscribed by a sidewall; a cutter assembly including an earth engaging member rotatably mounted on axle means; and means for mounting said cutter assembly within said pocket such that the earth engaging member projects outwardly from the cylindrical body to contact the borehole; said mounting means comprising:

cap means defining means for capturing an end portion of said axle member; and having a sidewall generally coextensive with the sidewall of said socket, and;

means for securing said cap means to said body within said socket, said securing means including:

the sidewall of each cavity defining a first groove therein;

the sidewall of each said cap means defining a second groove therein which, when the cap is disposed within said cavity, cooperates with said first groove to form a tubular chamber;

a countersunk bore extending through said cap from the outer face to the opposite face thereof in alignment with a threaded opening in said socket and defining a first large diameter opening extending from the outer face of said cap means and terminating in a second reduced diameter bore extending from an intermediate position through said cap means;

a transverse passage extending through said cap from within said first large diameter opening to said second groove;

means inserted into said tubular chamber

through said first large opening and said transverse passage for bridging the facing surfaces of said cap and socket and locking said cap within said socket; and,

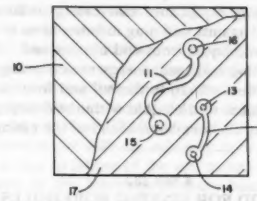
a headed bolt inserted within said countersunk bore and threaded into said threaded opening in said socket for further securing said cap to said body and blocking the transverse passage to prevent escape of said locking means in said tubular chamber.

4,548,285

MEASUREMENT OF SURFACE AREA FOR ELECTRODEPOSITION PLATING PROCESSES

Richard L. Sells, P.O. Box 2, Mount Liberty, Ohio 43048, and Mark L. Taylor, 1156 Willard Ave., Columbus, Ohio 43212

Filed May 11, 1984, Ser. No. 609,148
Int. Cl.⁴ G01G *23/22*
U.S. Cl. 177—1 **5 Claims**



1. A method for accurately calculating the plating area for an etched electronic circuit board in connection with the electrodeposition of materials upon the circuit etchings of said boards, consisting of:

(a) providing a first weight measurement for the board in a first condition in which the board is coated with a material having a known unit weight per unit surface area;

(b) providing a second weight measurement for the board in a second condition in which the area of the material coating of the board corresponding to the area of the electronic circuit to have a material electrodeposited therein, is removed from the board;

(c) comparing said first and second weight measurements and determining the surface of the electronic circuit according to the formula:

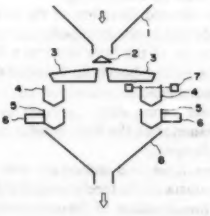
$$(\text{First Weight} - \text{Second Weight}) \times \frac{(\text{surface area})}{\text{coating weight}} \text{ unit}$$

4,548,286

COMBINATORIAL WEIGHING METHOD AND APPARATUS WITH VOLUME AND DENSITY SENSING

Takashi Sashiki, Nagaokakyo and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Dec. 2, 1983, Ser. No. 557,337
Claims priority, application Japan, Dec. 3, 1982, 57-212954; Dec. 4, 1982, 57-212871
The portion of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.⁴ G01G *19/32*
U.S. Cl. 177—1 **10 Claims**



5. A combinatorial weighting method for weighing out batches of articles in a weighing section, the batches of articles having a variable apparent specific gravity, to a weight value equal to or closest to a target weight value, and for discharging the weighed out batches of articles in order that the batches of

articles may be packaged in a packaging vessel, said method comprising the steps of:

(a) weighing out the batches of articles, to a weight value equal to the target weight value or closest to the target weight value within preset allowable limits, to the weighing section;

(b) detecting the volume of the batches of articles supplied to the weighing section;

(c) detecting the density of the batches of articles in accordance with the weight value and the detected volume; and

(d) adjusting the target weight value to be within the preset allowable limits, in accordance with the detected density, in such a manner that the volume of the batches of articles discharged into the packaging vessel becomes substantially constant.

4,548,287

COMBINATION WEIGHING MACHINE WITH VIBRATORY FEEDING AND COLLECTING HOPPER

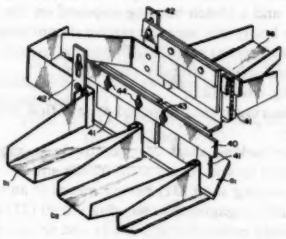
Yoshikazu Matsuura, Tokyo, Japan, assignor to Teraoka Seiko Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,632

Claims priority, application Japan, Jul. 31, 1982, 57-117632[U]; Jul. 31, 1982, 57-117633[U]; Oct. 29, 1982, 57-164887[U]; Oct. 30, 1982, 57-192283; Jan. 31, 1983, 58-14343; Jan. 31, 1983, 58-14340; Jan. 31, 1983, 58-14342; Feb. 28, 1983, 58-31926; Apr. 30, 1983, 58-65951[U]

Int. Cl.⁴ G01G *19/22*

U.S. Cl. 177—25 **20 Claims**



19. A weighing apparatus comprising a distributing table for receiving product to be weighed, feeding troughs mounted around the periphery of said distributing table to form a plurality of branched passages for the product, pool hoppers and weighing hoppers connected to the respective feeding troughs for transferring said product on said distributing table through said feeding troughs and said pool hoppers into said weighing hoppers, computer means for selecting a combination of a plurality of said weighing hoppers the total weight of the product therein which is substantially equal to a set weight to open the selected weighing hoppers to exhaust the weighed product therein, said distributing table comprising a set of two elongated vibrating distributing plates respectively transferring said product in opposite directions, and a mounting plate located above each said distributing plate and including at least one control plate adjustable in height and downwardly extending toward an inlet port of said feeding troughs, said control plate regulating the amount of product supplied to said feeding trough, said feeding troughs are mounted at respective outer edges of said distributing plates in side-by-side relationship in the transferring directions of said product and extending perpendicularly to said outer edges of the plates in parallel relationship with one another, said pool hoppers and weighing hoppers are continuously arranged at respective exhaust ports of said feeding troughs, each of said pool and weighing hoppers includes a bottom plate, and an opening and closing mechanism for each of said pool and weighing hoppers.

4,548,288

ELECTRONIC BALANCE

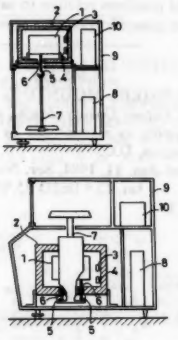
Akira Komoto, Shiga, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Feb. 7, 1984, Ser. No. 577,669

Claims priority, application Japan, Feb. 9, 1983, 58-20359

Int. Cl.⁴ G01G *21/28, 7/00, 21/28, 23/00*

U.S. Cl. 177—180 **6 Claims**



1. An electronic balance which uses as a force for balancing a weight loaded on a weighing tray a force produced by an electromagnetic force-transducer consisting of a magnetic circuit and an electromagnetic force-coil kept movable in the static field made by said magnetic circuit said electronic balance comprising:

a constant-temperature casing enclosing said force-transducer therein, and being provided with a through hole at the bottom through which a force transmitting means penetrates connecting between said weighing tray and said electromagnetic force-coil of said electromagnetic force-transducer;

a heater for heating up said constant-temperature casing at a predetermined constant temperature higher than room temperatures;

a temperature sensor for detecting the temperature inside said constant-temperature casing; and

an electronic control circuit for controling said heater according to the output signal from said temperature sensor

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4,548,289

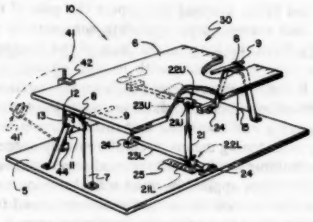
VARIABLE RESISTANCE TILTBOARD FOR EVALUATION OF BALANCE REACTIONS

Richard W. Mechling, 830 Vedado Way, NE., Atlanta, Ga. 30308

Filed Nov. 14, 1983, Ser. No. 551,061

Int. Cl.⁴ A61B *5/10*

U.S. Cl. 128—774 **22 Claims**



1. An apparatus for the objective analysis and quantification of human balance reactions, comprising:

a base;

a platform pivotably supported above said base for supporting a person whose balance reactions are to be analyzed;

variable resistance means operatively associated with said platform and said base for providing a selectively variable predetermined resistance to the movement of said platform relative to said base; and

measuring means operatively associated with said platform and said base for measurement of a parameter of the movement of said platform relative to said base so as to obtain an objective quantification of a person's balancing ability.

4,548,290

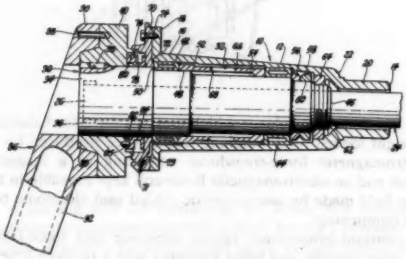
ROAD WHEEL MOUNTING ASSEMBLY

Roger R. Smith, Lapeer County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 11, 1984, Ser. No. 619,260

Int. Cl.[4] B62D *55/00*

U.S. Cl. 180—9.1 **11 Claims**



1. A mounting assembly suitable for supporting a road wheel associated with a track laying vehicle comprising:

a sleeve rigidly attached to the hull of the track laying vehicle, said sleeve extending horizontally from the hull;

a torsion bar coaxially mounted within said sleeve, said torsion bar having a first end rigidly attached to the hull of the vehicle and a second rotating end extending beyond the outboard end of said sleeve;

a spindle interposed between said sleeve and said torsion bar, said spindle surrounding and enclosing the major portion of said torsion bar located within said sleeve, said spindle being attached to said torsion bar so as to transmit rotation applied to the spindle to the torsion bar;

bearing means interposed between the spindle and the sleeve to provide axial-rotation of the spindle and torsion bar relative to the housing;

a hub mounted on the outboard end of said spindle and affixed to rotate therewith;

a road wheel support arm having a hub engaging end juxtaposed said hub and a road wheel engaging end, the road wheel end being adapted to support the axle of the road wheel, said support arm extending substantially perpendicularly from the longitudinal axis of the torsion bar so that the axle is mounted with its axis aligned with the torsion bar at a position removed from said torsion bar so that vertical movement of the axle causes a rotation of the hub engaging end about the axis of the torsion bar; and

a plurality of fastening means circumferentially spaced about the hub, holding the hub and the road arm together so that rotational forces applied by road wheel motion are transmitted to the torsion bar as torsional forces, said fasteners being adapted so that explosive bending moments applied to said road arm will cause the fasteners to shear causing the road arm to separate from the hub before the torsion bar is subjected to forces sufficient to cause bending of the bar.

4,548,291

STEERING SYSTEM OF A VEHICLE

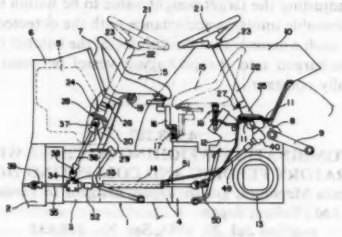
Tomiho Tanaka, Sakai, and Masahide Osujo, Sennan, both of Japan, assignors to Kubota, Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,374

Claims priority, application Japan, Oct. 20, 1982, 57-15992[U]

Int. Cl.[4] B62D *1/18*

U.S. Cl. 180—321 **3 Claims**



1. A steering system for a vehicle having a vehicle body with a longitudinal axis, and running wheels steerable from a first and a second position, said second position being disposed rearwardly with respect to said first position, a working implement activating device with a lateral flank and mounted on a portion of a transmission case, disposed on the rear side of the vehicle body, and a clutch housing disposed on the front side of the vehicle body; said steering system comprising:

(a) rotary shaft means extending in parallel to said longitudinal axis and spaced laterally therefrom;

(b) a steering wheel (**21**);

(c) a first steering means disposed at said first position and including:

(i) an interlocking shaft **36** operatively connected at a lower end to said rotary shaft means and

(ii) a connecting shaft (**31**) having means at an upper end removably engaging said steering wheel (**21**) and being operatively connected at a lower end to said interlocking shaft;

(d) a second steering means disposed at said second position and including:

(i) an input shaft (**43**) having means at an upper end for removably engaging said steering wheel and a first helical gear (**46**) at a lower end;

(ii) an output shaft (**44**) having a second helical gear (**47**) at an upper end thereof in mesh with said first helical gear (**46**), and a lower end operatively connected to said rotary shaft (**35**); and

(iii) a case (**40**) housing the first and second helical gears and mounted on said lateral flank;

wherein the interlocking shaft (**36**) is slanted transversely of the vehicle body with the lower end thereof being located outwardly of the upper end of interlocking shaft (**36**), the interlocking shaft (**36**) being disposed laterally outwardly of the clutch housing (**3**);

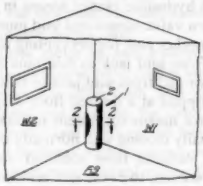
wherein the input shaft (**43**) is slanted longitudinally and transversely of the vehicle body with the lower end thereof being located rearwardly and outwardly of the upper end of said input shaft, wherein the second helical gear (**47**) being located outwardly of the first helical gear (**46**) transversely of the vehicle body and wherein the output shaft (**44**) is slanted longitudinally and transversely of the vehicle body such that the lower end thereof is located forwardly and outwardly of the upper end of the output shaft, the output shaft (**44**) being disposed laterally outwardly of the transmission case (**44**).

4,548,292

REFLECTIVE ACOUSTICAL DAMPING DEVICE FOR ROOMS

Arthur M. Noxon, 437 Lawrence, Eugene, Oreg. 97401

Filed Oct. 1, 1984, Ser. No. 656,677
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—295 **10 Claims**



1. A sound dampening device for use within a room area, said device comprising,

a continuous sound absorbent member of elongate tubular shape,

a closure means in place on the opposite ends of said absorbent member to define therewith a chamber,

porous sheet material in place about said sound absorbent member, and

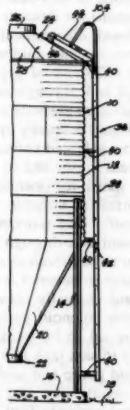
a reflector overlying said porous sheet, said reflector having a reflective zone extending only partially about said absorbent member to reflect wave frequences approximately 300 Hz and above with the absorbent member serving to dampen lower frequencies.

4,548,293

BIN LADDER CONSTRUCTION

Alvin D. Haab, Milford, Ind., assignor to Brock Manufacturing, Inc., Milford, Ind.

Filed Jul. 13, 1984, Ser. No. 630,751
Int. Cl.[4] E06C *9/02*
U.S. Cl. 182—99 **11 Claims**



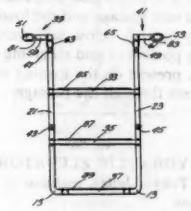
1. A ladder construction comprising a substantially vertical ladder section and an inclined ladder section, each of said ladder sections comprising a pair of longitudinally extending channel-shaped side rails each having a central web and side flanges, interconnected by a plurality of transversely extending hollow rungs open at both ends, a pair of corner pieces interconnecting said substantially vertical ladder section and said inclined ladder section and each including a planar body section lying coplanar with said ladder rail webs and having extending therefrom a pair of offset flanges lying between respective ladder rail flanges and against respective webs and secured to said rails, a pair of hand rails extending up from said substantially vertical ladder section and overlying said inclined ladder section, and a pair of elongated hand rail mounting members extending through and beyond respective hollow rungs in said substantially vertical ladder section and said inclined ladder section and on which said hand rails are mounted.

4,548,294

LADDER FOR A BOAT AND METHOD OF FABRICATION

Jerome Ruda, Syracuse, and Vernon L. Ludwig, Rome City, both of Ind., assignors to Harris Manufacturing Corporation

Filed Sep. 22, 1982, Ser. No. 421,360
Int. Cl.[4] E06C *5/24, 7/48*
U.S. Cl. 182—206 **10 Claims**



1. A removable ladder to be placed over the side of a boat and extended into water for aiding swimmers and the like in entering the boat from the water comprising:

a pair of elongated generally parallel extending upright members terminating at respective first ends in boat engaging hooks; and

a series of cross members extending generally parallel to one another and spanning said upright members to form a sequence of steps, each step comprising a pair of laterally displaced cross members with one of each step forming pair of cross members being coplanar with the upright members, while the other of each step forming a pair of cross members includes end portions extending generally perpendicular to both the upright member and the one cross member for supporting the other cross member in its laterally displaced position, the hooks comprising a pair of generally orthogonal projections at each first end, one extending generally parallel to and displaced from the direction of upright member elongation and the other extending generally parallel to and displaced from the cross members and the upright members and the cross members being formed of hollow aluminum tubing of generally square cross sectional configuration.

4,548,295

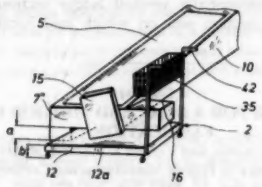
COUNTER SYSTEM

Gillis Lundgren, Lönashult, Sweden, assignor to Inter-Ikea AG, Lucerne, Switzerland

Filed Mar. 21, 1983, Ser. No. 477,075
Claims priority, application Denmark, Mar. 22, 1982, 1285/82
Int. Cl.[4] A47F *10/04*
U.S. Cl. 186—63 **21 Claims**

1. A counter system comprising at least one counter, a plurality of shopping carts each having a width and a loading surface for articles, said counter including a cashier's section as well as a conveyor band for advancing the articles to said section, and a passage defined in part by said counter through which the carts are moved past the cashier's section, characterized in that the counter comprises a receiving section having a lower overhanging portion at a distance from a floor on which

the system is situated only slightly greater, preferably a few millimeters such as 4 millimeters, than a distance from the loading surface of a cart to the floor, said passage having a width slightly smaller than the width of the shopping cart such that the shopping cart can only be pushed forward manually in



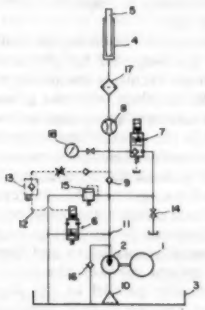
said passage when it is positioned perpendicularly to the receiving section and said passage and the loading surface of the cart simultaneously extends below said receiving section, the lower overhanging portion of said receiving section removing the articles, if any, present on the loading surface of the cart when said cart passes through the passage.

4,548,296

HYDRAULIC ELEVATOR

Kisaku Hasegawa, Tokyo, Japan, assignor to Oil Drive Kogyo, Ltd., Tokyo, Japan

Continuation of Ser. No. 315,235, Oct. 26, 1981, abandoned, which is a continuation of Ser. No. 149,507, May 13, 1980, abandoned. This application Jan. 6, 1984, Ser. No. 568,521
Claims priority, application Japan, Feb. 26, 1980, 55-23263
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—17 **3 Claims**



1. A hydraulic elevator of the type in which a working oil is transferred from a tank to a jack having a ram, or vice versa, by means of a constant capacity type hydraulic pump so as to move said ram up and down to cause said elevator to ascend or descend, respectively, comprising:

a cage type induction electric motor in operable connection with a source of electric power and said pump, for driving said pump during ascent of said elevator, and for driving by said pump during descent of said elevator so as to feed generative electric power developed in said motor to said source of electric power;

hydraulic circuit means for conducting said working oil between said tank, said pump and said jack;

non-return valve means in said hydraulic circuit means between said pump and said jack for preventing the transfer of said working oil from said jack to said pump;

normally open electronically-controlled variable flow solenoid valve means in said hydraulic circuit for preventing the transfer of said working oil from said pump to said jack during starting of said motor means and also upon said ascending elevator's reaching a desired floor stop;

pilot control means in said hydraulic circuit means for applying a hydraulic pressure signal from said hydraulic circuit means to said normally open electronically-controlled variable flow solenoid valve to cause said valve to close;

normally closed electronically-controlled solenoid valve means in said hydraulic circuit means in parallel between said non-return valve means and said pump at one end and said tank at another end, for preventing the transfer of said working oil from said jack to said tank during ascending of said elevator and from said jack to said pump when said elevator is stopped at a desired floor stop;

electronic control means for ascent for starting said motor and for gradually closing said normally open electronically-controlled variable flow solenoid valve means once said motor is started, to cause said working oil to be transferred at a gradual rate of flow by said pump from said tank to said jack to cause said elevator to begin to ascend at a slow speed; for closing said normally open electronically-controlled variable flow solenoid valve means completely when said elevator has begun to ascend at said slow speed, to cause said working oil to be transferred by said pump at a maximum output rate of flow to said jack to cause said elevator to further ascend at an accelerating speed; for maintaining said normally open electronically-controlled variable flow solenoid valve closed completely upon said further ascending of said elevator, to cause said working oil to continue to be transferred by said pump to said jack at said maximum output rate of flow to cause said elevator to ascend at a maximum speed; for gradually opening said normally open electronically-controlled variable flow solenoid valve means as said elevator approaches a desired floor stop, to cause said working fluid to be transferred by said pump to said jack at a decreasing output rate of flow to cause said elevator to further ascend to said desired floor stop at a decelerating speed; and for causing said normally open electronically-controlled variable flow solenoid valve means to assume its normally open state, to cease the transfer of said working oil from said pump to said jack, and to stop said motor when said elevator has ascended to said desired floor stop;

electronic control means for descent for gradually opening said normally closed electronically-controlled variable flow solenoid valve, to cause said working oil to be transferred, under the influence of gravity acting upon said elevator, from said jack through said pump to said tank, and to apply a hydraulic pressure signal to said pilot control means to close said normally open electronically-controlled variable flow solenoid valve, to cause said pump to rotate and drive said motor and to cause said elevator to descend at a slow speed; for opening said normally closed electronically-controlled variable flow solenoid valve completely to transfer said working oil at an increasing rate of flow from said jack through said pump to said tank to cause said motor to be driven at an increasing speed and to cause said elevator to descend at an accelerating speed; for maintaining said normally closed electronically-controlled variable flow solenoid valve completely open to cause said working oil to be transferred from said jack through said pump to said tank at a maximum output rate of flow to drive said pump and said motor at a maximum speed, and while maintaining said normally closed electronically-controlled variable flow solenoid valve completely open, energizing said motor so as to cause said motor to be driven as a generator by said pump to supply electrical power to said source of electrical power, and to cause said elevator to descend at a maximum speed; for controlling said normally closed electronically-controlled variable flow solenoid valve such that the rate of flow of said working oil transferred therethrough is greater than the rate of flow of said working oil through said pump to said tank; for gradually closing said normally closed electronically-controlled variable flow control valve to cause

said working oil to be transferred from said jack through said pump to said tank at a decreasing rate of flow as said elevator approaches a desired stop floor to cause said elevator to descend at a decelerating speed; and for causing said normally closed electronically-controlled variable flow solenoid valve to assume its normally closed state to cease the transfer of said working oil from said jack when said elevator has descended to said desired floor stop and to de-energize said motor; and

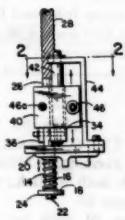
an electronic flow meter in said hydraulic circuit means between said non-return valve means and said jack and in operable connection with both said electronic control means for ascent and descent, for detecting deviation of the rate of flow of said working oil from a set value and for applying a feedback signal corresponding to said deviation to said electronic control means for ascent and descent to cause said normally open and normally closed electronically-controlled variable flow solenoid valves to be adjusted to cause said rate of flow of said working oil to be regulated to said set value.

4,548,297

ELEVATOR CAR VIBRATION CONTROL WITH FRICTION DAMPER

John K. Salmon, South Windsor, and Young S. Yoo, Avon, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 9, 1983, Ser. No. 550,277
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—20 **4 Claims**



1. An elevator car that comprises a beam across the top of the car for suspending the car from a rope, characterized by:

a thimble rod that extends through the crosshead, one end being attached to the rope;

a compressible spring located between the crosshead and the other end of the thimble rod;

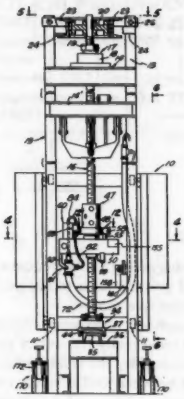
a dampener that is attached to the car for dampening motion of the thimble rod and relative to the beam, comprising: a vertical pin that is attached to the crosshead; a first block member that is attached to the thimble rod and fits partially around the vertical pin in contact therewith; a second block member that fits partially around the vertical pin and mates with the first member; a pair of bolts that hold the first and second members together around the pin and applying pressure thereon to provide resistive force to the vertical movement of the pin.

4,548,298

ROTOR AND SCREW ELEVATOR EQUIPPED WITH A FAIL-SAFE CONTROL SYSTEM

Raymond W. Born, 17282 Mt. Wynne Cir., Fountain Valley, Calif. 92708

Continuation-in-part of Ser. No. 197,264, Oct. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 944,601, Sep. 2, 1978, abandoned. This application Mar. 30, 1983, Ser. No. 480,597
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—25 **65 Claims**



1. Elevator apparatus comprising:

a cab movable vertically of upright frame means;

vertically suspended steep-pitch screw means operatively associated with said frame means;

rotor means encircling and engaged with said screw means and operable to propel said cab therealong;

means holding one only of said screw means and said rotor means stationary and against rotation;

hydraulic motor-pump means having a rotary driven connection with one of said screw means and said rotor means not held stationary and including means for supplying pressurized fluid thereto to propel said cab upwardly therealong;

means normally holding the non-stationary one of said screw means and said rotor means against rotation thereby to hold said cab stationary and releasable to a position permitting auto-rotation of the non-stationary one of said screw means and said rotor means; and

means for supplying pressurized fluid to said motor-pump means in a direction to propel said cab upwardly along said screw means and including means for controlling the flow of fluid through said motor-pump means in the reverse direction to permit downward cab travel along said screw means when the non-stationary one of said screw means and said rotor means is released for auto-rotation.

4,548,299

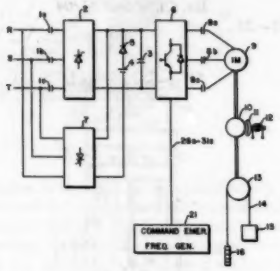
AC ELEVATOR CONTROL SYSTEM

Masami Nomura, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,970
Claims priority, application Japan, Apr. 20, 1982, 57-65846
Int. Cl.[4] B66B *5/00*; H02J *9/04*
U.S. Cl. 187—29 R **4 Claims**

1. An AC elevator control system comprising an elevator car and a counter weight connected to both ends of a traction rope respectively, a sheave over which said traction rope is trained, an induction motor for driving said sheave, a con-

verter for converting an AC power to a direct current, an inverter for inverting said direct current from said converter to an AC power with a variable voltage at a variable frequency to supply said AC power to said induction motor, a battery connected across the DC side of said inverter and forming an electric source for actuating said inverter upon the occurrence of a power failure and/or a fault and a command emergency frequency generator responsive to the occurrence of a power



failure or fault for delivering a low frequency command emergency signal to said inverter so as to not generate regenerative power with said inductive motor;

wherein said command emergency frequency signal from said command emergency frequency generator, is set to a value as determined by the relationship between a difference in weight between said elevator car and said counter weight and various losses of a system for driving said induction motor.

4,548,300

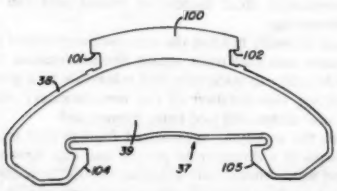
DISC BRAKE FRICTION PAD AND STABILIZING SUPPORT

David D. Sheill, Farmington Hills; Donald J. Davidson, Troy, and David J. Dettloff, Utica, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1983, Ser. No. 528,299

Int. Cl.[4] F16D *65/00*

U.S. Cl. 188—73.1 **5 Claims**



1. A vehicle disc brake comprising a rotor having oppositely disposed friction surfaces secured for rotation with a vehicle wheel, a caliper slidably mounted to a support, said caliper having a leg depending adjacent one friction surface of said rotor, actuating means disposed adjacent the other friction surface of said rotor, reaction abutment means between said actuating means and said caliper, a first friction pad disposed between said depending caliper leg and said rotor and a second friction pad disposed between said actuating means and the other friction surface of said rotor, means slidably supporting a radially outer portion of said first friction pad on said caliper and means engaging the radially inner portion of said first friction pad in an interference fit with spaced surfaces of said caliper leg to prevent vibration between said first friction pad and said caliper leg.

4,548,301

NEGATIVE ACTING DISC BRAKE

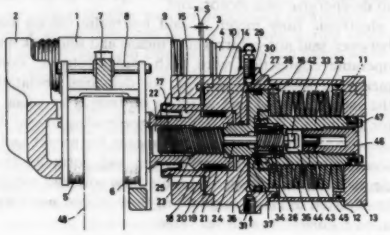
Yoshinori Koshino, and Shiro Nakajima, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Japan

Filed Nov. 17, 1983, Ser. No. 552,494

Claims priority, application Japan, Nov. 27, 1982, 57-207887

Int. Cl.[4] F16D *65/38*

U.S. Cl. 188—196 C **4 Claims**



1. A negative acting disc brake comprising a torque member, an outer caliper, an inner caliper, a pair of brake pads mounted on the opposing surfaces of said outer and inner calipers, a cylinder member mounted in said inner caliper and formed with an annular flange to form therein a first cylinder and a second cylinder, a first piston mounted in said first cylinder for pressing one of said brake pads, an adjust bolt having a first threaded portion threadedly engaging said first piston, a second piston mounted in said second cylinder and adapted to engage said adjust bolt to press said first piston toward said one of said brake pads, said second piston being normally urged toward said first piston and adapted to retract when fluid pressure is applied to said second cylinder, said adjust bolt having a second threaded portion which has a larger lead than said first threaded portion and is reverse thereto in direction, a threaded socket mounted on said second threaded portion on said adjust bolt to threadedly engage it and adapted to engage said second piston, and a one-way clutch interposed between said threaded socket and said second piston so as to prevent said socket from turning when said adjust bolt turns in such a direction as to move away from said first piston and allow it to turn when said adjust bolt tends to turn in a reverse direction.

4,548,302

TWO-STAGE CLUTCH DAMPER ASSEMBLY

Thaddeus Lech, Jr., Farmington Hills, and Robert A. Frantz, Grosse Pointe Park, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

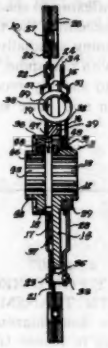
Filed Nov. 30, 1983, Ser. No. 556,519

Int. Cl.[4] F16D *3/12*

U.S. Cl. 192—106.2 **7 Claims**

1. A two-stage clutch damper assembly for an automotive vehicle clutch driving a transmission input shaft, including a hub assembly having a main hub barrel splined onto the input shaft and an integral radial flange with equally spaced peripheral notches, a clutch plate carrying friction facings at the outer periphery thereof, a spring retainer plate secured to the clutch plate to sandwich said hub flange therebetween, said plates having sets of circumferentially spaced windows therein axially aligned with said hub flange notches, and damper springs received in each set of windows and notches, the improvement comprising an inner hub splined onto said input shaft and an intermediate hub having a radial flange located between said clutch plate and main hub, said hub flange notches extending circumferentially beyond said plate windows to allow limited rotation of said plates relative to said hub

without compression of said damper springs, and said inner and intermediate hubs having interengaging helical teeth causing



axial movement of said inner hub upon rotation of said intermediate hub.

4,548,303

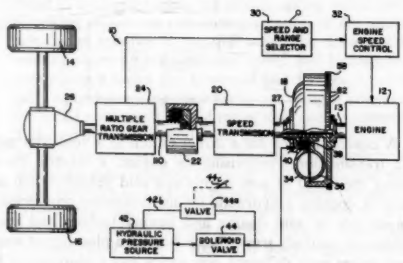
COMPOSITE DRIVE FOR A TRACTOR INCLUDING A FLUID COUPLING ASSEMBLY WITH A LOCKUP CLUTCH

Richard B. Beemer, Lombard; Richard G. Hennessey, Oak Lawn, and Harold W. Melles, Downers Grove, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 423,893, Sep. 27, 1982, Pat. No. 4,526,255, which is a continuation-in-part of Ser. No. 240,040, Mar. 3, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,036

Int. Cl.⁴ B60K *41/22*

U.S. Cl. 192—3.31 **9 Claims**



1. A composite drive for an implement such as a tractor having an engine output shaft, comprising:

a range transmission including means for providing a plurality of speed ranges;

a speed transmission comprising means for providing a plurality of speeds including a series of alternately actuated shift clutch means;

master clutch means operable to selectively operably connect an output shaft of said speed transmission with an input shaft of said range transmission whereby said speed transmission drives said range transmission; and

fluid coupling means for operably connecting said engine output shaft with said speed transmission whereby said engine output shaft drives said speed transmission, said fluid coupling means including lockup clutch means operable within predetermined speed limits of said engine output shaft to transfer torque through said fluid coupling means, said fluid coupling means further including fluid torque transfer means for transmitting torque when said lockup clutch means is disengaged;

said lockup clutch means being disengageable attendant to disengagement of said master clutch means, and said lockup clutch means being engageable subsequent to engagement of said master clutch means, with said fluid torque transfer means effecting torque transfer from said engine output shaft when said lockup clutch means is disengaged.

4,548,304

ONE-WAY CLUTCH AND WINDING AND REWINDING DEVICE FOR CAMERA USING THE SAME

Toru Nagata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1982, Ser. No. 442,022

Claims priority, application Japan, Nov. 17, 1981, 56-184632; Nov. 17, 1981, 56-184633

Int. Cl.⁴ G03B *1/12*; F16D *11/00, 41/12*

U.S. Cl. 192—46 **4 Claims**

1. A one-way clutch including:

(a) an input member which is connected to means for generating a drive force and which can be shifted to a first direction and to a second direction depending on a transmitting direction of said driving force;

(b) an intermediate member which can have its relative position shifted in relation to the shifting of said input member, and is at the same time shifted in a first direction together with said input member when the input member is shifted in the first direction;

(c) a transmitting member which changes its posture, when said input member is shifted in the first direction, according to said shifting of the relative position of the intermediate member;

(d) an output member which engages with said transmitting member, when said input member is shifted in the first direction, by a change in the posture of said transmitting member, and is shifted in the first direction together with said input member, thus transmitting the drive force to a follower side; and

(e) supporting means for supporting said output member and said intermediate member separately so that said output member will not directly operate on said intermediate member, said supporting means supporting said output member and said intermediate member in such a way that they can be shifted respectively in the first direction and in the second direction.

4,548,305

TORQUE OVERLOAD RELEASE COUPLING

Conrad V. Anderson, Minneapolis, Minn., assignor to Zero-Max Industries, Incorporated, Minneapolis, Minn.

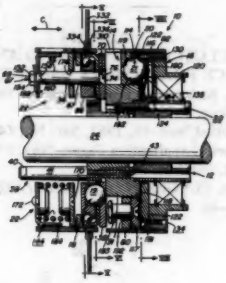
Filed Jan. 6, 1983, Ser. No. 456,181

Int. Cl.⁴ F16D *43/20*

U.S. Cl. 192—56 R **48 Claims**

1. A torque limiting device comprising a rotatable first assembly, an intermediate assembly, a second assembly, first means for drivingly interconnecting said first assembly to said intermediate assembly for rotation therewith, second means for

disengageably drivingly interconnecting said intermediate assembly to said second assembly for rotation therewith, said second means including a plurality of circumferentially spaced main balls each at least partially disposable within a pair of recesses defined by said intermediate and second assemblies, means for generating a reference force, and bearing means for connecting the first and second assemblies while permitting relative rotation therebetween, said second means being responsive to said reference force for disengaging said intermediate assembly from said second assembly when the axially directed force due to the torque applied thereto exceeds the reference force, and wherein said first means includes a plurality of spline balls each at least partially disposed in angularly spaced angularly relation one to another and separately from one another within registrable recesses defined by the first assembly and the intermediate assembly.



4,548,306

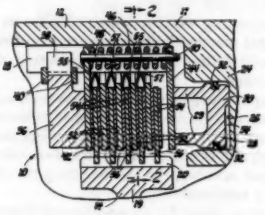
PLATE SEPARATOR

James F. Hartz, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1984, Ser. No. 605,246

Int. Cl.[4] F16D *13/52*

U.S. Cl. 192—70.28 **3 Claims**



1. In a clutch having a pair of outer friction plates supported on a first member of said clutch for bodily shiftable movement along an axis of said clutch, an inner friction plate between said outer friction plates supported on a second member of said clutch rotatable on said axis relative to said first member, said inner friction plate cooperating with said outer friction plates in defining an outer annulus around said axis, and pressure means selectively operable to compress and clamp said inner friction plate between said outer friction plates thereby to rigidly connect said first and said second members, a unitary plate separator in said annulus comprising, a circular spine extending 360° around said axis and disposed in a transverse plane perpendicular thereto, means defining a first bifurcation integral with said spine and projecting to one side of said transverse plane, means defining a second bifurcation integral with said spine and projecting to the other side of said transverse plane, each of said bifurcations having an end engageable by an adjacent one of said outer friction plates when said pressure means clamps said inner friction plate between said outer friction plates whereby said bifurcations are resiliently flexed generally at their junctures with said spine, each of said bifurcations thereafter unflexing to space apart said outer friction plates a distance exceeding the thickness of said inner friction plate, means defining a radially extending tab on said plate separator integral with said spine, and slot means on said first member operative to slidably receive said tab whereby relative rotation between said plate separator and said first member is foreclosed.

4,548,307

CONTROL DEVICE FOR DIRECT CLUTCH IN AUTOMATIC TRANSMISSION

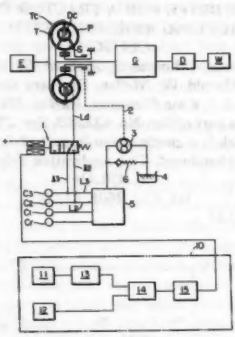
Masao Nishikawa, Tokyo, and Shinzou Sakai, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1982, Ser. No. 449,242

Claims priority, application Japan, Dec. 12, 1981, 56-200360

Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.076 **4 Claims**

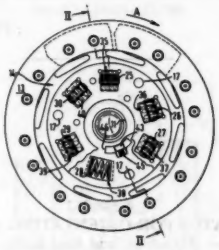


1. A control device for a direct clutch in a vehicular automatic transmission, comprising an engine, a throttle for increasing the speed of said engine and said vehicle when said throttle is opened, a hydraulic torque converter connected at its input side to said engine and having turbine and pump impellers; an auxiliary transmission having a plurality of stages of gear trains with different gear ratios and a plurality of hydraulic friction clutch means for actuating said gear trains selectively, said gear trains being connected to the output side of said torque converter; and a hydraulically actuated direct clutch having a working fluid passage through which said clutch receives hydraulic pressure, said clutch being capable of directly coupling the pump and turbine impellers of said torque converter upon receipt of said hydraulic pressure, wherein said friction clutch means include first and second clutch means associated with and actuating the highest speed stage and the secondary high speed stage of said gear trains, respectively, said first and second clutch means having working fluid passages for receiving hydraulic pressures therethrough for engagement thereof, said working fluid passages of said friction clutch means being selectively connected through a control valve to the working fluid passage of said direct clutch for feeding a part of the hydraulic pressure being supplied to said friction clutch means to said direct clutch for direct connection thereof through operation of said control valve in response to the levels of vehicle speed and throttle opening degree.

4,548,308
FRICTION CLUTCH DRIVEN PLATE

John B. Little, Coventry, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Nov. 12, 1982, Ser. No. 441,212
Claims priority, application United Kingdom, Nov. 14, 1981, 8134380
Int. Cl.⁴ F16D 3/66
U.S. Cl. 192—106.2 2 Claims



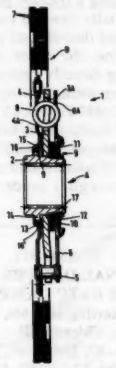
1. A friction clutch driven plate comprising:
a hub;
a fixed hub flange fast with the hub;
a friction facing carrier plate mounted on the hub for rotation relative to the hub;
an auxiliary hub flange mounted on the hub for rotation relative to the hub;
stop means for limiting the angle of relative rotation between the carrier and said flanges;
a plurality of sets of co-operating spring windows in the fixed hub flange, the friction facing carrier plate and the auxiliary hub flange, at least some of the windows in the auxilary hub flange being shorter than the corresponding windows in the fixed hub flange;
a plurality of damping springs, each of which is accommodated in a corresponding set of said spring windows;
and locking means for preventing rotation of the auxiliary hub flange relative to the hub when the driven plate is rotating above a predetermined speed, said locking means comprising a radial slot in one of said flanges, a centrifugally operable spring returnable bob weight constrained for radial movement in said radial slot, and a substantially T shaped aperture in said other flange into which said bob weight extends, said aperture having a circumferentially extending inner portion allowing relative angular movement between said flanges at low rotational speeds of the driven plate and a radially outwardly extending portion into which said bob weight can be urged at higher speeds by centrifugal force to lock said flanges against relative rotation.

4,548,309
CLUTCH PLATE FOR USE IN FRICTION CLUTCHES OF MOTOR VEHICLES AND THE LIKE

Helmut Braun, Sinzheim, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,199, Dec. 14, 1983, abandoned. This application Feb. 10, 1984, Ser. No. 579,097
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248119
Int. Cl.⁴ F16D 3/12, 3/14, 3/66
U.S. Cl. 192—106.2 29 Claims

1. A clutch plate, particularly for use in the friction clutches of motor vehicles, comprising a first rotary unit including a hub; a second rotary unit including at least one friction lining, said units being rotatable relative to each other within a predetermined range and said units being further movable within limits radially with reference to one another; energy storing means interposed between said units to yieldably oppose their rotation relative to each other, at least within a portion of said range; and a combined centering and friction generating assembly arranged to yieldably oppose rotation of said units relative to each other, at least within a portion of said range, and to

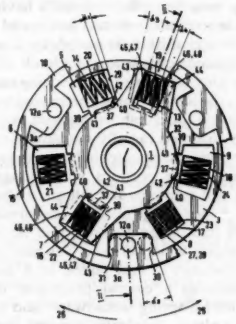


simultaneously center said units with reference to each other, comprising a first component provided on and rotatable with said first unit in immediate proximity of said hub and having a substantially conical surface, a second component provided on and rotatable with said second unit and having an at least linear contact with said conical surface, and resilient means for biasing said components toward each other.

4,548,310
TORQUE TRANSMITTING DEVICE

Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen Und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 382,565, May 27, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 654,038
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121376
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.⁴ F16D 3/66
U.S. Cl. 192—106.2 18 Claims



1. A torque transmitting device, particularly a clutch plate for use in friction clutches of automotive vehicles, comprising a rotary output assembly; a rotary input assembly coaxial with and arranged to transmit torque to said output assembly, said

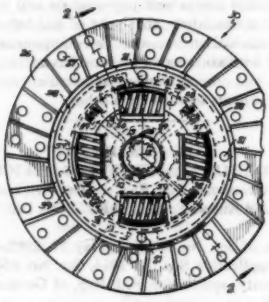
assemblies being rotatable relative to each other through a predetermined angle and one of said assemblies including a substantially disc-shaped portion; energy storing means interposed between and arranged to yieldably oppose rotation of said assemblies relative to each other; and a third assembly constituting torsional vibration damping means installed in the path of transmission of torque between said input and output assemblies and including a friction generating first component at one side and an axially stressed resilient second component at the other side of said disc-shaped portion, said second component reacting against the other of said input and output assemblies and bearing directly against said first component, at least one of said components having at least one portion extending substantially axially through said disc-shaped portion and the other of said components bearing axially against said portion of said one component, said components cooperating to frictionally oppose relative rotation of said input and output assemblies at least through a predetermined portion of said angle.

4,548,311

VEHICLE TORSIONAL DAMPER HAVING LOW RATE AND HIGH RATE DAMPING STAGES

Thaddeus Lech, Jr., Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 423,878
Int. Cl.⁴ F16D 3/66
U.S. Cl. 192—106.2 **4 Claims**



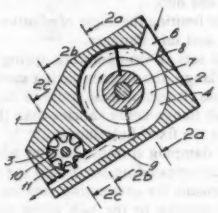
1. In a multi-stage torsional damping device providing a low rate substantially frictionless primary stage to eliminate idle gear rattle and a normal rate final stage with both resilient and friction damping, including a hub assembly having a barrel, a clutch driven plate journalled on said hub barrel and carrying annular friction facings at its outer periphery, a spring retainer plate secured in spaced relation to said clutch driven plate by a plurality of stop pins, said plates sandwiching said hub assembly therebetween, the improvement comprising a two-part hub assembly including an inner hub having said hub barrel and a pair of oppositely disposed radially outwardly extending sector-shaped flange portions, an outer hub having an annular ring encompassing said flange portions with elongated notches therein receiving said stop pins and integral radially inwardly extending sector-shaped flange portions conformably received between the inner hub flange portions, said outer hub flange portions having spring windows axially aligned with complementary spring windows in said plates, each said inner hub flange portion includes a central peripheral notch axially aligned with additional spring windows in said clutch driven and spring retainer plates, and damper springs received in said first mentioned aligned spring windows and in said notches and aligned spring windows, the length of each notch being greater than the length of the aligned spring windows to provide limited relative rotation between said clutch driven and spring retainer plates and inner hub, a pair of friction plates on opposite sides of said hub assembly and positioned between said hub assembly and said clutch driven and spring retainer plates, said friction plates being operatively connected to said outer hub, outwardly diverging radial gaps between said inner and outer hub flange portions to allow limited relative rotation therebetween, and at least one idle rattle damper spring operatively connected between said inner and outer hub flange portions.

4,548,312

APPARATUS FOR ORIENTATING ARTICLES

David R. Lauder, Timperley, and Alan Bailey, Cheadle, both of England, assignors to British Nuclear Fuels plc, Warrington, England

Filed Mar. 16, 1984, Ser. No. 590,566
Claims priority, application United Kingdom, Mar. 23, 1983, 8307977
Int. Cl.⁴ B65G 47/24
U.S. Cl. 198—392 **4 Claims**



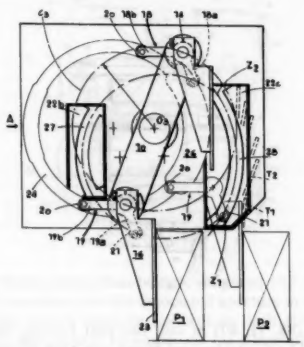
1. An apparatus for receiving randomly orientated substantially cylindrical articles and for arranging that the articles, on leaving the apparatus, are all orientated with their longitudinal axes in the direction of travel of the articles, the apparatus comprising a housing, an entry passage in the housing, a first chamber having a peripheral contoured channel dimensioned to receive articles falling thereinto under gravity from the entry passage, a downwardly inclined outlet passage leading from the channel, said outlet passage being dimensioned to permit passage of articles therealong when the longitudinal axes of the articles are either in the direction of travel or normal thereto and to prevent the passage of articles therealong when the articles are in other orientations, a rotor within the first chamber operable to sweep the channel in the direction of travel of the articles to remove articles in said other orientations from the entrance of the outlet passage and to convey such articles for representation at the outlet passage, a second chamber within the housing, the outlet passage merging with the second chamber and a further rotor within the second chamber rotatable in a direction opposed to the direction of travel of the articles along the outlet passage, the further rotor being dimensioned to permit the passage of articles disposed with their longitudinal axes in the direction of travel and to topple articles disposed with their longitudinal axes normal to the direction of travel into positions such that said axes lie in the direction of travel whereby all articles which enter the outlet passage exit therefrom with their longitudinal axes in the direction of travel.

4,548,313

DEVICE FOR FORMING BATCHES OF BOX SHAPED PRODUCTS IN SIDE BY SIDE ROWS IN PARTICULAR OUT OF SUPPLY LINE INFED PARCELS LIABLE TO LOSE THEIR SHAPE

Giorgio Occhialini, S. Lazzaro di Savena; Gabrio Grazia, Bologna, and Fausto Forlani, Mezzolara, all of Italy, assignors to Mac-Pack S.R.L., Italy

Filed May 17, 1983, Ser. No. 495,470
Claims priority, application Italy, Jun. 11, 1982, 3457 A/82
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—430 **9 Claims**



6. In a device for forming batches of box-shaped products into continuous side-by-side rows advancing in an outfeed direction, the products being parcels liable to lose their shape, pusher means comprising:

a rotary member mounted for rotation about a horizontal axis,

a pair of pushing arms each mounted in pivoted cantilevered fashion on said rotary member at a predetermined distance from said axis,

a pair of generally L-shaped levers each mounted at its vertex to said rotary member for pivotal movement with a respective one of said levers, each lever having first and second rollers at its respective extremities, said first rollers lying in a first vertical plane perpendicular to said axis and said rollers in a second vertical plane perpendicular to said axis,

generally circular first guide track means in said first plane for slidingly receiving said first rollers, said first guide track means having a radius equal to said predetermined distance and being eccentric with respect to said rotary means, said first guide track means including a region of enlarged size in which a predefined degree of unguided movement of said first rolles is permitted, and

second guide track means in said second plane for slidingly receiving said second rollers, said second guide track means including a guide track portion positioned and constructed to receive said second rollers while said first rollers are in said region of enlarged size, said track portion being generally in the form of a circumferential segment of a circle of diameter greater than said predetermined distance and eccentric with respect to said rotary means and said first track means,

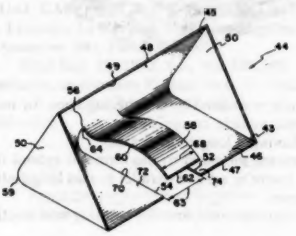
said pushing means being constructed and arranged so that the pushing arms successively engage said parcels while said pushing arms are near their positions of extreme vertical travel, said pushing arms being maintained upright, said first track being positioned so that said first rollers are also at their extreme vertical positions, whereby said pushing arms remain substantially upright during the time said parcels are engaged thereby, said portion of said second track being positioned to receive said second rollers when the respective pushing arm approaches its position of maximum forward travel, said first roller being disposed within said region of enlarged size, whereby the pushing arm is rotated so as to draw its lower end away from said parcel.

4,548,314

BUCKET ELEVATOR AND METHOD OF MAKING SAME

Preston Marsh, 74 W. Curtis Rd., R. #1, Hope, Mich. 48628

Filed Apr. 25, 1983, Ser. No. 488,032
Int. Cl.[4] B65G *17/36*
U.S. Cl. 198—712 **18 Claims**



4. A bucket elevator for conveying product, such as grain or beans, comprising:

a hollow tubular casing including a pair of laterally-spaced side walls closed by spaced-apart inner and outer walls which span said side walls;

sprocket wheel means, mounted for rotation on said casing, including a plurality of circumferentially-spaced chain-driving sprocket teeth;

an endless conveyor chain, trained around said sprocket wheel means for movement in an endless path, including a plurality of swingably coupled links, which are, during at least a portion of said endless path, in sliding engagement with said inner wall; at least one of said links including a pair of laterally-spaced side bars having inner terminal surfaces which are in wiping engagement with aid inner wall and outer terminal surfaces, and a pair of longitudinally-spaced transverely disposed pins spanning said side bars to provide a sprocket tooth receiving passage between said side bars and said pins;

a bucket for conveying product, mounted on said one link comprising:

a pair of parallel side walls moiunted in said casing in wiping engagement with and parallel to said casing side walls, said side walls of said bucket including inner terminal edges adjacent said inner wall;

a bottom wall in wiping engagement with said inner wall, including a pair of laterally-spaced bottom wall segments fixed at their laterally outer edges to the inner terminal ends of said side walls, and having inner terminal edges abutting said side bars of said link;

an outwardly extending, forwardly projecting back wall, integral with said bottom wall and fixed to the side walls of said bucket; and

a link cover for covering said sprocket tooth receiving passage in said link including;

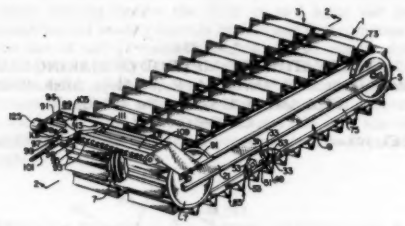
a cantileverally supported forwardly projecting tab, having a rearward end integral with said back wall, and a free forward end in bearing engagement with said outer terminal surfaces of said link side bars.

4,548,315

TETHERED VEHICLE FOR MOVING BULK MATERIAL

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jun. 7, 1983, Ser. No. 501,835
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] B65G *19/00*
U.S. Cl. 198—728 29 Claims



1. A vehicle restrained by a tethering rope for moving bulk materials, said vehicle comprising:

a frame having a longitudinal axis;

traction means mounted to the frame to extend therebelow and to rotate in a plane parallel to said longitudinal axis of the frame;

motive means on said frame for rotating said traction means; and

hitch means, including a hitch member to which the tethering rope is secured, connected to one end of the frame to restrain the vehicle as the motive means rotates the traction means to pull against the tethering rope so that bulk material under the traction means is moved toward the first end of said frame, said hitch means including means to selectively move said hitch member laterally on the frame such that the point at which the tethering rope is connected relative to the frame can be adjusted laterally with respect to the longitudinal axis of the frame, to control lateral movement of the vehicle, said traction means and tethering rope providing the sole points of support for said vehicle.

4,548,316

RUN-BACK SAFETY MECHANISM FOR CONVEYOR APPARATUS

Ruprecht Maurer, Bad Homburg, Fed. Rep. of Germany, assignor to Ringspann Albrecht Maurer, K.G., Bad Homburg, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,347
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245347
Int. Cl.[4] B65G *23/26, 43/08*
U.S. Cl. 198—835 17 Claims

1. Return run or run-back stop mechanism for a conveyor (1, 2; 10, 11) having

a conveyor shaft (4, 40, 60, 81) coupled to the conveyor;

a fixed frame (50, 73, 89);

a one-way clutch or coupling connection (7, 8; 25–32) between the conveyor shaft and the fixed frame to permit rotation of the conveyor shaft in one predetermined direction and prevent rotation of the conveyor shaft in reverse direction,

said one-way clutch connection having

a ring-shaped first element (45, 64, 84);

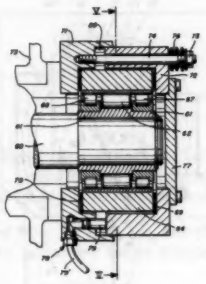
a circular second element (41, 61, 82) concentric with said first element;

and coupling means (42, 62, 83) located between said first and second elements, one (41, 61, 82) of said elements being coupled to the conveyor shaft, the other (45, 64, 84) of said elements being coupled to the fixed frame (50, 73, 89), and said coupling means (42, 62, 83) being arranged to permit free running of said conveyor shaft in said one predetermined direction, but cause engagement with the other element upon reverse direction of rotation,

said mechanism comprising, in accordance with the invention,

a rotatable friction coupling means positioned between the outer (45, 64, 84) of said coupling elements and the frame (50, 73, 89), including

a two-part holding ring (48, 49; 71, 72; 87, 88) having axial surfaces paired with and fitted to face axial surfaces of the other of said elements, at least one of said surfaces being formed as a friction surface (46, 47; 69, 70; 85, 86),



one part (48, 71, 87) of said two-part holding ring being secured to the frame and facing one axial surface of the other of said elements, the other part (49, 72, 88) being non-rotatably and axially movably secured to said first part and facing the other axial surface of the other of said elements;

and adjustable releasable axially acting pressure force means (91, 52, 76) adjustably pressing the other part axially against the other axial surface of the other of said elements for, selectively, locking the other of said elements in fixed position with respect to the frame to form a back-run stop, or frictionally controlled slipping between said elements and hence controlled back-run or return-run of the conveyor.

4,548,317

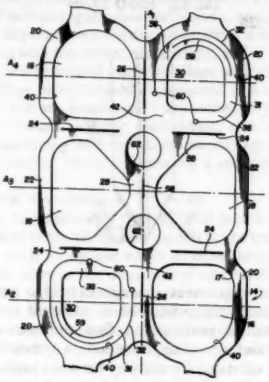
BOTTLE MULTI-PACKAGE AND MULTI-PACKAGING DEVICE

William N. Weaver, Northbrook, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 17, 1983, Ser. No. 553,004
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—162 4 Claims

1. In a package which includes a package making device for unitizing a plurality of containers having a cylindrical body region and reduced diameter neck portion terminating with a dispensing opening, the device formed from a resilient elastic deformable sheet of plastic material and comprising at least two rows and three ranks of integrally connected bands creating reconfigurable container receiving and gripping apertures, the bands surrounding and frictionally engaging the cylindrical body region of each container, a longitudinal axis defined substantially midway between the lateral edges of the device, the rows being situated on opposing sides of said longitudinal axis, a plurality of rank axes perpendicularly disposed to said longitudinal axis, lateral web means lying on the longitudinal axis integrally connecting pairs of adjacent apertures in a given rank, longitudinal web means integrally connecting pairs of adjacent apertures in a given row, a pair of finger gripping loops each extending from the inner margin of diagonally opposite apertures in the end ranks of the device, each loop emanating from and secured by hinge means in the innermost quadrant of said diagonally opposed end rank apertures, the

innermost quadrant extending between the lateral and longitudinal web means associated with said diagonally opposite apertures, said hinge means defined as including two extremities lying on either side of an imaginary line that divides the innermost quadrent into two substantially equal segments, the



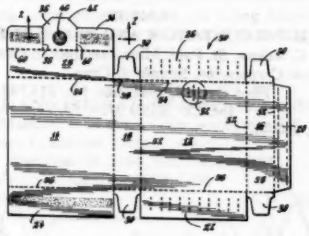
finger gripping loops thus being configured and arranged so that they extend across the associated aperture in the plane of the carrier device prior to application with the bottle-like containers and extend upwards to the plane of the device responsive to the association of a container with the aperture.

4,548,318

3 CELL RECLOSABLE DISPENSER

Daniel J. Boyle, Hartland, Wis., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 31, 1983, Ser. No. 547,033
Int. Cl.[4] B65D *5/72*
U.S. Cl. 206—621 **3 Claims**



1. A carton construction comprising a front wall, a back wall, a bottom wall, a top wall, and a first and second side wall connecting said front and back walls; said top wall including:

a first top wall panel foldably connected to said back wall,

a second top wall panel forming an extension of said first top wall panel foldably connected to said first top wall panel, said second top wall panel extension including at least one cover flap defined by

a pair of parallel and spaced perforated score lines disposed perpendicular to the fold line between said first top wall panel and said second top wall panel extension and

a lift tab connecting said first and second parallel perforated score lines and extending beyond the top edge of said second top wall panel extension,

a debossed circular area located on said cover flap, and said front wall including

a third top wall panel foldably connected to the top edge of said front wall and secured to the first top wall panel connected to said back wall, and

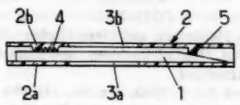
at least one substantially circular weakened line portion formed in said front wall adjacent the top edge of said front wall and having a part of its weakened line portion coexistive with said top edge adapted to be placed in sealed engagement with the debossed area on said cover flap, whereby upon lifting of said cover flap and tearing the same between said parallel perforated score lines, the weakened line portion on said front wall can be removed from said front wall to form a reclosable dispensing opening through which the contents of the carton can be dispensed.

4,548,319

INDIVIDUAL CASE FOR A WIND INSTRUMENT REED

Jacques L. Llorente, La Garenne Colombes, France, assignor to Societe Anonyme dite, Paris, France

Filed Sep. 28, 1983, Ser. No. 536,900
Claims priority, application France, Oct. 27, 1982, 82 17970
Int. Cl.[4] A45C *11/00*
U.S. Cl. 206—314 **6 Claims**



1. A case for holding a wind instrument reed comprising a one piece body having a u-shaped transverse cross section and including:

first and second, resilient, longitudinally extending, transversely spaced arms forming a reed storage area, each arm having first and second longitudinal ends;

a back portion connecting the arms together;

nipping projections extending from a selected one of the arms, adjacent a first longitudinal end thereof, into the reed storage area to grip the reed;

an abutment surface extending from a selected one of the arms, adjacent a second longitudinal end thereof, into the reed storage area to further hold the reed;

the arms forming a pair of transversely aligned notches located approximately one-third the length of the arms from the first longitudinal ends thereof.

4,548,320

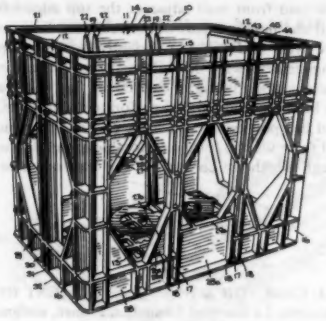
HEAVY-DUTY FULL-DEPTH BEVERAGE CASE

Theodor M. Box, Brielle, N.J., assignor to Piper Industries of Texas, Inc., Dallas, Tex.

Filed Jul. 1, 1980, Ser. No. 165,034
Int. Cl.[4] B65D *21/02, 1/42*
U.S. Cl. 206—509 **9 Claims**

1. A heavy-duty unitary plastic molded full-depth beverage case comprising pairs of side and endwalls and a bottom, the top of said case having an outwardly projecting stacking rim extending around the case, a similar lower rib member disposed adjacent said rim, an upper panel on each sidewall extending downwardly from said top and terminating in a lower edge at an intermediate point, a plurality of pairs of vertical ribs disposed along each panel from said rim to said lower edge, a pair of horizontal ribs disposed around said case adjacent said lower edge, alternate pairs of said vertical ribs extending from top to bottom of said case to define structural columns for transmitting compressive stresses through the case

in a stacked configuration with other similar cases and angular gusset plates formed at the juncture of said structural columns



with said panel, each plate having an outwardly projecting rib along its angular edge merging with adjacent vertical ribs.

4,548,321

FOIL BAG

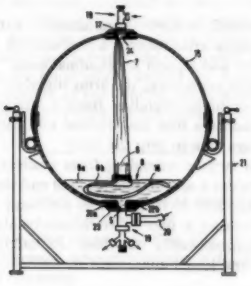
Erich Möckesch, Heilbronn, and Hans-Herbert Noack, Öhringen, both of Fed. Rep. of Germany, assignors to Bier-Drive AG, Chur, Switzerland

Filed Jul. 1, 1983, Ser. No. 510,294

Claims priority, application European Pat. Off., Jul. 7, 1982, 82106081.1

Int. Cl.⁴ B65D *85/00, 90/04, 90/08*

U.S. Cl. 206—525 **5 Claims**



1. A foil bag for receiving liquid inside a spherical pressure tank provided in collapsed condition, said foil bag comprising two flat disk shaped foil pieces, a seam joining the foil pieces to each other in sealing relationship around their peripheral edges, each foil piece being so shaped and so arranged relative to the other foil piece that when the joined pieces are filled with a liquid inside a spherical tank they conform to the spherical interior shape of the tank, a filling connecting piece penetrating and sealed to one of the foil pieces at the center thereof, the orientation and position of the seam and the filling connecting piece being such that when the foil pieces are folded up in the form of an umbrella inside a cover sheath with the foil piece not provided with a filling connecting piece being inserted into the foil piece provided with the filling connecting piece, the filling connecting piece being disposed at one end of said sheath and the seam being disposed at the other end of said sheath, and the seam being located such that when the foil pieces are filled with a liquid inside a spherical tank, the seam lies in a plane perpendicular to the axis of the filling connecting peace.

4,548,322

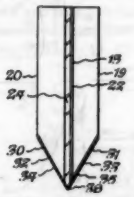
DUAL COMPARTMENT POWDER CARTRIDGE

John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,041

Int. Cl.⁴ B65D *25/08*

U.S. Cl. 206—526 **4 Claims**



1. A dual compartment powder cartridge comprising a casing fabricated from porous sheet material and having a central longitudinal portion and first and second opposite edges and first and second opposite ends, a pair of folds on said casing located substantially midway between said central longitudinal portion and said first and second edges, first and second edge portions proximate said first and second edges, respectively, lying in superimposed relationship with each other and with said central longitudinal portion, first seam means joining said first and second edge portions and said central longitudinal portion to each other to provide a compartment between said first seam means and said folds, said first and second opposite ends of said sheet material having superimposed first and second end portions, respectively, after said first and second edges and said central portion have been joined by said first seam means, second seam means joining said first end portions of said sheet material to seal first ends of said compartments, third seam means joining said second end portions of said sheet material to seal second ends of said compartments, and powder in said compartments.

4,548,323

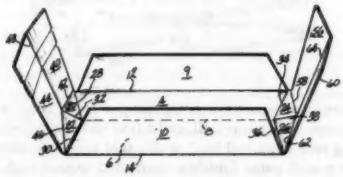
MAILING CONTAINER AND BLANK THEREFOR

Vernon C. Rekow, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 22, 1981, Ser. No. 313,742

Int. Cl.⁴ B65D *5/54, 75/14*

U.S. Cl. 206—611 **5 Claims**



1. A paperboard container comprising:

(a) a pair of trapezoidal bottom panels foldably connected along a bottom medial score line, said bottom panels having end edges converging inwardly toward said bottom medial score line, said end edges being equal in length, and said bottom panels sloping upwardly away from said bottom medial score line;

(b) a pair of generally diamond shaped end wall assemblies at each end of said container, each end wall assembly comprising a pair of triangular end wall panels with each of said triangular end wall panels being foldably connected to a respective one of said inwardly converging end edges

of said bottom panels, with the triangular end wall panels in each pair being foldably connected to each other along a basal score line;

(c) a top cover assemblage comprising a pair of trapezoidal top cover panels having converging end edges of equal length, at least one of said end edges on each of said top cover panels being foldably connected to a corresponding edge of said triangular end wall panels, and said top cover panels sloping downwardly away from a top medial line bisecting said top cover assemblage; and

(d) a pair of trapezoidal top cover flaps with each of said top cover flaps being foldably connected to a respective one of said bottom panels, said top cover flaps sloping upwardly toward said top medial line, and said top cover flaps underlying said top cover assemblage.

5. A paperboard blank for forming a container, said blank comprising:

(a) a medial score line;

(b) a pair of trapezoidal bottom wall panels foldably connected to each other along said medial score line, said bottom wall panels each hving end edges of equal length converging toward each other in the direction of said medial score line;

(c) first and second triangular end wall panels foldably connected to first ones of said end edges of said bottom wall panels, said first and second triangular end wall panels being foldably connected to each other along said medial score line;

(d) third and fourth triangular end wall panels foldably connected to opposite ones of said end edges of said bottom wall panels, said third and fourth triangular end wall panels being foldably connected to each other along said medial score line;

(e) a pair of trapezoidal top cover flaps foldably conncted to outer edges of said bottom wall panels along score lines which are parallel to said medial score line, said connected bottom wall panels, top cover flaps, and triangular end wall panels together forming a hexagon; and

(f) a top cover assemblage comprising first and second pairs of trapezoidal top cover panels, one pair of which is foldably connected to said first and second triangular end wall panels and extends from one corner of said hexagon, and the other pair of which is foldably connected to said third and fourth triangular end wall panels and extends from the opposite corner of said hexagon, with the individual trapezoidal top cover panels in each pair being foldably connected to each other along said medial score line.

4,548,324

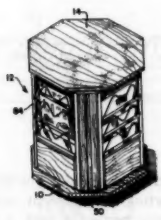
TABLE AND LITERATURE DISPLAY STAND

Sherman E. Mackey, Jr., Celina, Ohio, assignor to S & K Products Co. Inc., Coldwater, Ohio

Filed Jan. 18, 1984, Ser. No. 571,883

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—58 **12 Claims**



1. A table and literature display stand comprising:

a base having a substantially flat support surface and a support post extending upwardly therefrom; .

a table top attached to an upper end of said post;

rack means including upper and lower support members rotatably attached to said post so that said rack means may be rotated while said table top remains stationary, a plurality of rack members attached at upper and lower ends thereof to said upper and lower support members, respectively, said rack members being positioned on said lower support member to form a substantially closed structure, and a plurality of vertically oriented dividers to cover spaces between adjacent ones of said rack members and increase stability of said rack means, said dividers being attached at upper and lower ends thereof to said upper and lower support members, respectively, said upper and lower support members including a plurality of channels adjacent to outer edges thereof and positioned in vertically spaced opposing pairs, each of said opposing pairs of channels and associated ones of said dividers holding a rack member therebetween;

each of said rack members having a plurality of compartments arranged in vertical columns, said compartments each having a lower pocket shaped to receive a lower portion of a piece of printed material:

frame means for supporting an upper portion of a piece of material positioned within each of said pockets such that indicia appearing on a face of printed material in said pocket is not substantially obscured thereby, said frame means including a plurality of rods, each having ends attached to an associated one of said pockets, opposing side portions extending upwardly and outwardly from said associated pocket and a central portion having a curvilinear shape such that printed material of different heights within said associated pocket may be supported thereby; and

said rack members each including a pair of opposing vertical channels and a plurality of transverse members extending therebetween, each of said transverse members having a downwardly and rearwardly inclined front wall, a rearwardly inclined rear wall extending downwardly from said front wall, and a floor extending outwardly from said rear wall, said transverse members being positioned in shingled relation.

4,548,325

TECHNICAL PEN HOLDER

Anke Hojer, Hamburg; Jurgen Bockmann, Tangstedt-Rade; Harald Hofmann, Hartenholm; Axel Mikuteit; Hans-Joachim Ritter, both of Hamburg, and Rolf Tenhagen, Henstedt-Ulzburg, all of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Mar. 5, 1984, Ser. No. 586,126

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 8306378[U]

Int. Cl.[4] B43K *23/00*

U.S. Cl. 211—69.5 **3 Claims**

1. A stand for receiving a tubular writing pen, comprising a stand with an insertion opening and a sealing element of elastically deformable material disposed within said stand and below said insertion opening, said sealing element adapted to come into a sealing engagement contact with the free end of the writing tube when the barrel of the tubular writing pen is

inserted, characterized in that the sealing element (4) further comprises a tube segment, with a central axis diposed substantially at a right angle to the direction of pen insertion, said tube segment having a bearing area for contact with a writing tube (12) that normally is convex curved in the direction toward said insertion opening of the stand (1, 2) and is deformable away from said insertion opening by said contact, and further characterized by an elastically deformable restraining element (5) which is provided between said sealing element (4) and said insertion opening, and adapted to engage against the barrel of an inserted tubular writing pen (10, 11, 12), so as to hold said pen in a rest position, with said writing tube substantially, locally deforming a bearing area of said sealing element.

4,548,326

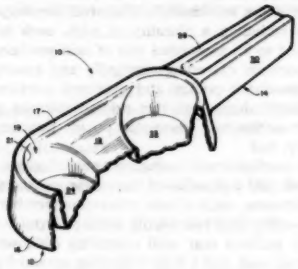
STADIUM SEAT ARM GRIPPING TRAY

John M. Danna, 8502 Organdy La., Santee, Calif. 92071, and Mark Speros, 3611 N. Euclid Ave., San Diego, Calif. 92105

Filed Sep. 21, 1984, Ser. No. 652,713

Int. Cl.[4] A47F 7/28

U.S. Cl. 211—71 **2 Claims**



1. A tray device for use in association with the arm rest assembly of a stadium seat, which arm rest assembly has a substantially horizontal arm rest portion with an upright brace portion extending downwardly from its longitudinal axis such that a vertical cross-section taken laterally through said arm rest assembly is substantially T-shaped, said tray device comprising, in combination:

an elongated tray portion having an elongated arm portion connected to its one end;

said tray portion having means for supporting at least one container;

said arm portion having an elongated top wall with laterally spaced side walls extending downwardly from its lateral edges; and

means for detachably securing said arm portion to said arm rest assembly comprising a U-shaped adapter member having a top wall with a pair of laterally spaced downwardly extending spring fingers, said spring fingers each having an inwardly extending lip that engages the bottom surface of the horizontal arm rest portion of the stadium seat, said spring fingers also having tongue members that extend outwardly therefrom and these are detachably secured into mating slots formed in the side walls of the arm portion of the tray device.

4,548,327

POLE ASSEMBLY FOR INSTALLING CLOSET SHELVES

John Kilkelly, Ocala, Fla., assignor to Clairson International Corporation, Ocala, Fla.

Filed Nov. 7, 1983, Ser. No. 548,920

Int. Cl.[4] A47F 5/08

U.S. Cl. 211—187 **2 Claims**

1. A pole assembly for locating and supporting shelves in a closet comprising:

a substantially rigid, vertically elongated pole structure;

and a plurality of shelf support clips attached to said pole structure at vertically spaced positions along one side, each of said clips defining a recess which is open at the top for receiving an edge rod on the front of a shelf;

said pole assembly being adapted to be positioned against a wall of the closet with said one side of the pole structure extending perpendicular to the wall to position each of said clips along the wall for the insertion of a pencil or the like to mark the position on the wall for the attachment of a wall-mounted shelf support clip;

said pole assembly being adapted to be positioned away from said wall of the closet with said one side of the pole structure facing toward said wall and positioing said clips in the pole assembly to hold the outer end of shelves whose inner ends are in support clips on said wall;

said pole structure comprising:

upper and lower vertically elongated pole members of hollow rectangular cross-section extending end-to-end in vertical alignment;

and a dowel received snugly in the adjoining ends of said pole members and holding them end-to-end in alignment.

4,548,328

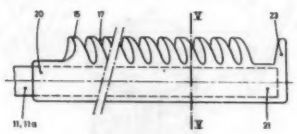
CLOTHES STAND

Egon Bräuning, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Jun. 4, 1982, Ser. No. 385,174

Claims priority, application Switzerland, Jul. 10, 1981, 4553/81

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—205 **1 Claim**

1. A clothes stand comprising a plurality of carrying arms fastened to a supporting arrangement, said carrying arms on their upper side being provided with a bearing portion for spacing apart several articles of clothing hanging on clothes hangers on each carrying arm, said bearing portion being provided with a plurality of comb teeth positioned at an angle of about 60° to a longitudinal axis of said carrying arm, said teeth being located parallel to one another at a distance of about 10 mm, said teeth having an upper portion being curved convexly in a transverse direction of the carrying arm and

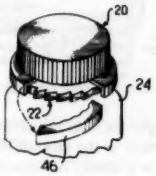
having substantially straight configuration in a longitudinal direction thereof, comb grooves located between said comb teeth, said comb grooves being adapted to receive hooks of said clothes hangers in such a way that the upper portions of the successive comb teeth in the longitudinal direction of the carrying arm form continuous bearing zone for the hooks of said clothes hangers which are disposed at an angle of at most 90° to a longitudinal axis against the angle of inclination of the comb teeth, and wherein a distal end of the bearing portion is formed as a radially outer end cap which is provided with an end bead formed integrally with said outer end cap.

4,548,329

CHILD RESISTANT/TAMPER RESISTANT CAP

John J. Curry, P.O. Box 5, Oak Brook, Ill. 60521

Filed Aug. 16, 1984, Ser. No. 641,392
Int. Cl.⁴ B65D *55/02*
U.S. Cl. 215—216 **16 Claims**



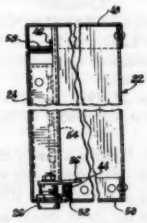
1. A closure cap for a container having a neck finish including external threads and a lower shoulder having external teeth, said closure cap comprising an end panel, a depending skirt and a lower locking band, said skirt having internal threads for locking rotatable engagement with a container external threads and said locking band having internal teeth for locking engagement with a container external teeth for preventing rotation of said closure cap relative to a container; the improvement wherein a portion of said locking band is integrally connected to said closure cap by rupturable means to facilitate removal of said locking band portion to permit release of said locking band from a container locking teeth, and said locking band portion forming tamper indicating means when removed.

4,548,330

TAMPER RESISTANT CONTAINER

Donald J. Hewitt, and Juan O. Becerra, both of San Diego, Calif., assignors to Hewitt Tubular Products, Inc., San Diego, Calif.

Filed Nov. 21, 1983, Ser. No. 553,834
Int. Cl.⁴ B65D *55/14, 43/16, 43/20*
U.S. Cl. 220—210 **4 Claims**



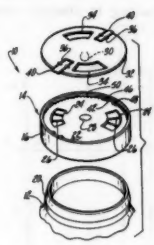
1. In combination, a tamper resistant container comprising a body portion having a top wall, a bottom wall, a rear wall, two opposed side walls and a front opening providing entry into the container, the container having recessed portions on the top and bottom walls defined by extensions of side walls bent to form said recessed portions adjacent said front opening; a door having opposed flanged sides and top and bottom flanges, said flanges extending in the same direction vertically and engaging said recessed portions when said door is locked closed over said front; a hinge operatively connecting one side wall of said body portion and one side of the door extending between said flanges, said hinge comprising a pintle with intermeshing leaves, said leaves being provided with gaps therebetween for relative movement whereby the door may move vertically along said pintle; and locking means for holding the door in a raised position vertically with the door flanges fitted within the corresponding recessed portions of the body portion when the door is moved vertically upward along said pintle.

4,548,331

CHILD RESISTANT DISPENSING CLOSURE

Gary V. Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 19, 1984, Ser. No. 673,012
Int. Cl.⁴ B65D *51/18*
U.S. Cl. 220—253 **18 Claims**



1. A two piece safety dispensing closure for a container comprising, in combination: a cylindrical cap having an annular skirt containing means for attachment to a container, and a flat top having a dispensing opening therethrough, a flat cover affixed to said cap for rotation relative thereto and having a dispensing opening therethrough, and a rocker arm occupying a portion of said cover and being pivotably connected thereto by a hinge, said rocker arm having a locking tab engageable with retaining means on said cap for locking said cover against rotation in a first closed position with said dispensing openings out of registration with each other, and upon depression of said rocker arm, said locking tab disengages said retaining means to permit rotation of said cover to a second dispensing position wherein said dispensing openings are aligned to form a passage for dispensing the contents of said container therethrough.

4,548,332

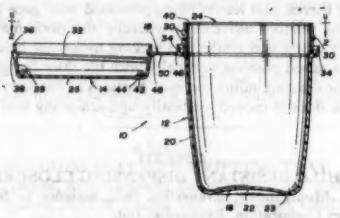
TAMPERPROOF PLASTIC CONTAINER

Benjamin C. Neat, 11201 Easum Rd., Jefferson Town, Ky. 40299

Filed Dec. 31, 1984, Ser. No. 688,002
Int. Cl.⁴ B65D *41/34*
U.S. Cl. 220—268 **10 Claims**

1. A container comprising: a receptacle, a cover, and a tether that are molded from plastic unitary with each other with the receptacle and cover connected by the tether; said receptacle having a lower closed end and also having a round upper end that opens upwardly; the cover including an upper wall and an annular lip that extends downwardly from the upper wall; mating helical threads on the upper end of the receptacle and the annular lip of the cover; said threads having slide surfaces that are slidably engaged with each other by an initial downward movement of the cover over the receptacle; said threads also having locking surfaces that are engaged with each other by a snap action upon continued downward cover movement to secure the cover in a closed position on the receptacle and prevent upward opening movement thereof without unthread-

ing rotation of the cover with respect to the receptacle; the tether having a length that is sufficiently long to permit the initial cover closing and sufficiently short to limit unthreading rotation of the closed cover in order to prevent opening



thereof with the tether intact connecting the receptacle and the cover; and the tether being frangible to permit unthreading rotation of the cover for opening while also providing a visual indication of such opening to thereby render the container tamperproof.

4,548,333

CONTAINER WITH EASY OPEN TYPE CLOSURE

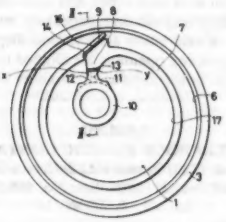
Koji Kobayashi, Saitama, and Keisuke Shimizu, Tokyo, both of Japan, assignors to Hokkai Can Co., Ltd., Tokyo and Snow Brand Milk Products Co., Ltd., Hokkaido, both of, Japan

Filed Nov. 30, 1984, Ser. No. 676,871

Claims priority, application Japan, Dec. 2, 1983, 58-187095[U]

Int. Cl.⁴ B65D *41/32*

U.S. Cl. 220—276 **13 Claims**



1. An easy open type closure for a container comprising:

a closure member made of at least a metallic foil sheet for being affixed together with a ring-shaped member to an edge of an opening of a container barrel body; and

a pull-opening member having a pulling tab connected to an initial end portion thereof and being connected to an upper surface of the closure member more firmly than a tearing strength of the closure member;

said pulling tab is constructed thinner in thickness relative to the pull-opening member at least at a small thickness portion neighboring adjacent to an initial end of an interconnection portion between the pull-opening member and the closure member.

4,548,334

ELECTRIC MOTOR HOUSING WITH END CAP

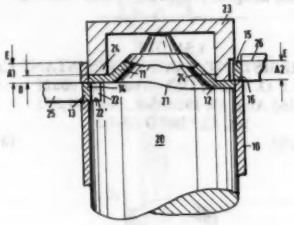
Walter Huber, Bietigheim-Metterzimmern, and Fritz Zucker, Sachsenheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 570,780

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302532

Int. Cl.⁴ H05B *3/60*

U.S. Cl. 220—293 **4 Claims**



1. An electric motor housing comprising:

a shell; and

an end cap fittingly inserted in said shell and having a supporting rim which in the relaxed position lies in a plane;

said shell having a plurality of inwardly extending supporting elements and a plurality of inwardly extending holding elements each of which in a circumferential direction of said shell is offset relative to said supporting elements;

said end cap having one side of said rim resting against supporting surfaces of said plurality of supporting elements and other side of said rim resting against supporting surfaces of said plurality of holding elements;

one of said surfaces of at least one of said holding elements being axially spaced from a reference plane a distance greater than the distance one of said supporting surfaces of one of said plurality of supporting elements adjacent thereto minus the thickness of said end cap whereby said end cap is positionally restrained under prestress between at least one of said holding elements and at least one of said supporting elements is inserted.

4,548,335

LIQUID CONTAINER

R. Scott Remes, Prior Lake, and Paul J. Thompson, Minneapolis, both of Minn., assignors to Minnesota Valley Engineering, Inc., New Prague, Minn.

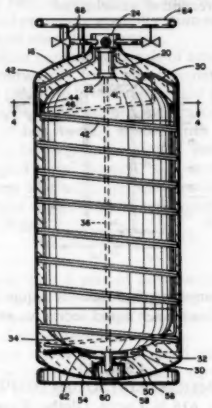
Filed Jun. 25, 1982, Ser. No. 392,022

Int. Cl.⁴ B65D *90/22*

U.S. Cl. 220—466 **9 Claims**

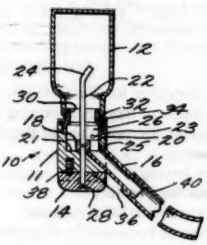
1. In a container for housing a liquid at temperatures which deviate greatly from normal comprising an inner vessel having top and bottom walls and vertically disposed side walls, an outer vessel enclosing the inner vessel and in spaced relation therewith to provide an insulated space therebetween, and an elongate neck tube extending from the top wall of the inner vessel to the top wall of the outer vessel to support the inner vessel therefrom, the improvement comprising an abutment extending inwardly from the inner wall of the outer vessel substantially across the space between the outer and inner vessels adjacent the upper end portions of the side walls

thereof, but short of direct contact with the inner vessel to protect said neck tube by limiting movement of the inner vessel



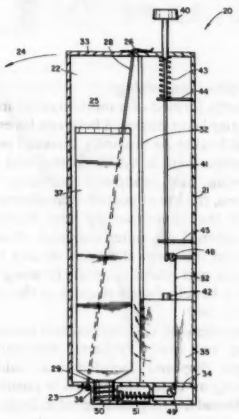
relative to the outer vessel during dymanic impacts resulting from tipovers or dropping.

4,548,336
TABLET DISPENSER
Robert L. Dove, Weyers Cove, Va., assignor to Degesch GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Sep. 27, 1983, Ser. No. 536,391
Int. Cl.[4] B65H *3/62*
U.S. Cl. 221—203 **4 Claims**



1. A toxic fumigant tablet dispensing device comprising a toxic fumigant tablet container support means having an interior chamber having, at one end thereof, a bottom wall and, at an opposite end thereof, an opening for receiving tablets from a container, said opposite end having means for mounting a container's open end thereon with the container open end in flow communication with said opening of said interior chamber, said container support means having a longitudinal axis and a dispensing channel extending from said bottom wall through said container support means to the exterior thereof and at an angle to said longitudinal axis, said interior chamber having movable dispensing means mounted on said bottom wall thereof, said container support means having actuating means carried externally thereof for actuating said movable dispensing means, said movable dispensing means including a star wheel mounted on a central axle, said central axle extending through a bore formed in said container support means with said bore having a diameter to thereby establish a close fit with said central axle, said central axle terminating exteriorally of said container support means, a handle means being secured to said axle on the portion thereof extending externally of said container support means whereby rotation of said handle will impart rotation to said star wheel through said axle, said axle extending through said interior chamber and beyond said opening at the opposite end of said interior chamber whereby said axle will extend into a container mounted on said opposite end to effect agitation of tablets in the container upon actuation of said star wheel, said means for mounting a container's open end including a neck portion having external threads and a base and a resilient sealing ring mounted about said base, said dispensing channel including a dispensing tube means secured in said channel and extending at an angle away from said container support means so as to prevent contact by a user operating said handle member with tablets dispensed through said dispensing tube means.

4,548,337
DISPENSER APPARATUS FOR THE CONTENTS OF COMPRESSIBLE AND COLLAPSIBLE TUBES
Donald A. Morris, R.R. 5, Crawfordsville, Ind. 47933
Filed Jun. 6, 1983, Ser. No. 501,278
Int. Cl.[4] B65D *35/54*
U.S. Cl. 222—96 **5 Claims**



1. A dispenser apparatus for dispensing a portion of the contents from a compressible tube or like container comprising:

a housing member defining an interior chamber and having a panel portion which is adapted and arranged to selectively open or close said interior chamber;

pressurizing means disposed in cooperation with said interior chamber for increasing the pressure within said interior chamber when said interior chamber is closed by said panel portion;

outlet means disposed within said interior chamber and adapted for receiving said compressible tube;

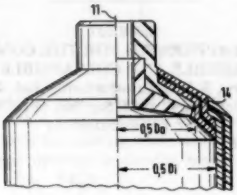
sealing means disposed between said panel portion and said interior chamber for tightly sealing said interior chamber when in said closed condition in order to enable the buildup of pressure within said interior chamber and compression of said tube;

mechanical linkage means for selectively activating said pressurizing means, said mechanical linkage means including an exteriorly exposed pushbutton which is spring-biased and coupled by a stem member to said pressurizing means and wherein said pressurizing means is an air pump having a normally open momentary switch for activating the generation of air pressure; and

outlet opening and closing means cooperatively arranged relative to said outlet means for selectively opening and closing said outlet with activation of said pressurizing

means by said mechanical linkage means, said outlet opening and closing means including a pulley arrangement in cooperation with a slide valve which is spring-biased.

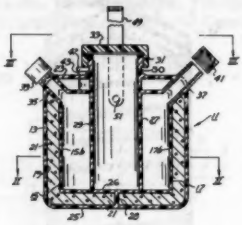
4,548,338
PACKING TUBE
Engelbert Sander, Vouvry, Switzerland, assignor to Automation Industrielle, S.A., Vouvry, Switzerland
Filed Oct. 26, 1983, Ser. No. 545,536
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240225
Int. Cl.⁴ B65D *35/10*
U.S. Cl. 222—107 **9 Claims**



1. A packing tube, comprising:
(a) a tubular body formed of a multi layered foil including a metallic barrier layer disposed between layers of synthetic material and having an inwardly directed peripheral rim;
(b) a headpiece formed of synthetic material having a discharge opening, said headpiece including two superimposed portions, the lower portion completely covering the underside of the upper portion and formed of a non-permeable material, the outer diameter of said headpiece being less than the inner diameter of said tubular body, and said upper and lower portions forming an outer rim edge which is bevelled with respect to the central axis of the headpiece; and
(c) a connecting element, disposed on said headpiece, including an upper and lower synthetic material layer and a metallic layer disposed therebetween, said connecting element having an outer rim which is positioned relative to the peripheral rim of said tubular body so that one overlaps the other, the superimposed layers of synthetic materials of said tubular body and said connecting element being welded to one another by inductive generation of heat in the metallic layers thereof and the exertion of pressure thereonto so that said synthetic material from at least one of said synthetic material layers of one of said connecting element and said tubular body is attached to the bevelled outer rim edge of said headpiece so as to overlie at least the interface of the upper and lower portions at said outer rim edge.

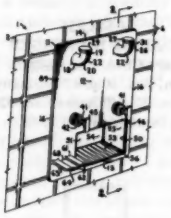
4,548,339
INSULATED LIQUID CONTAINER
Michael W. Gorman, P.O. Box 2282, Port Charlotte, Fla. 33952
Filed Apr. 9, 1984, Ser. No. 598,032
Int. Cl.⁴ B67D *5/56*; B65D *1/04*
U.S. Cl. 222—129 **9 Claims**

1. An insulated liquid container comprising,
(a) an outer vessel having a top, side wall and a bottom;
(b) a first inner liquid receptive vessel within said outer vessel and spaced apart from the inner wall of said outer vessel;
(c) a second inner liquid receptive vessel within the outer vessel and spaced apart from both said first inner liquid receptive vessel and said inner wall of the outer vessel;
(d) a third inner liquid receptive vessel within said outer vessel and spaced apart from the inner wall, top and bottom of said outer vessel, said third inner liquid receptive vessel having a wall portion that is common to both said first and said second inner liquid receptive vessels, and having an extension that protrudes through said top;
(e) means for filling individually said first, second and third inner liquid receptive vessels; and



(f) means for emptying individually liquid from said first, second and third inner liquid receptive vessels.

4,548,340
FLUSH-MOUNTED LIQUID DISPENSER
Charles L. Messer, 616 N. Curtis, Olathe, Kans. 66061
Filed Apr. 9, 1984, Ser. No. 598,496
Int. Cl.⁴ B67D *5/52*
U.S. Cl. 222—135 **14 Claims**



14. A liquid dispenser for flush-mounting in a wall having front and back layers of materials forming a wall cavity therebetween and having tiles attached to the front material layer, which comprises:
(a) a faceplate having:
(1) front and back surfaces;
(2) upper, lower and side margins;
(3) a plurality of horizontally aligned inlet openings positioned in spaced proximity to said upper margins;
(4) a plurality of horizontally aligned outlet openings, each said outlet opening being positioned in spaced relation below a respective inlet opening; and
(5) a soap dish opening in spaced proximity above said lower margin and adjacent one of said side margins;
(b) a plurality of fill spouts each including a horizontal leg attached to said faceplate front surface and a vertical leg terminating at an upper end with a flange, said fill spouts each communicating with a respective inlet opening;
(c) a plurality of fill spout caps each having a respective flange for releasable interlocking engagement with a respective fill spout flange, said fill spout caps being adapted to close said fill spout upper ends;
(d) a plurality of male, threaded outlet tubes attached to and extending fowardly from said face plate front surface, each said outlet tube communicating with a respective outlet opening;
(e) a plurality of plunger-type pump assemblies, each including a respective cap with female threads adapted for threadable engagement with the respective outlet tube, a plunger reciprocably received in said cap and having a

dispenser nozzle and a check valve actuated by said plunger;

(f) a soap dish including a top, a bottom, a back, sides and a plurality of ribs on said bottom, said soap dish being attached to and extending inwardly from said faceplate back surface at said soap dish opening;

(g) a razor holder comprising a pair of arms attached to and extending outwardly from said faceplate in spaced relation to said faceplate lower margin and adjacent the other of said faceplate side margins, said razor holder comprising a pair of horizontally spaced arms each including a substantially horizontal, proximate portion and an upwardly angled distal portion, said arms forming a slot therebetween adapted to receive a razor handle;

(h) a plurality of discrete liquid reservoirs each having:

(1) a front edge;

(2) a back;

(3) a top;

(4) a bottom with a pair of downwardly-sloping panels terminating at an upwardly-open trough extending front-to-back with respect to said reservoir; and

(5) a pair of opposite sides;

(6) each said reservoir being glued along its respective front edge to said faceplate back surface whereby said reservoir is positioned in communication with respective inlet and outlet openings;

(i) a plurality of locating pins and locating pin receivers located at the connection of said faceplate back surface and said reservoir front edges;

(j) said locating pin receivers being adapted to receive said locating pins whereby said reservoirs are positioned on said faceplate back surface in predetermined positions;

(k) said faceplate back surface having a perimeter around said soap dish and said reservoirs;

(l) said dispenser being adapted for flush-mounting in said wall with said perimeter substantially covering an opening formed in said wall by removing a predetermined number of tiles and a corresponding portion of said front material layer;

(m) said dispenser being attached to said wall by adhesive spots applied to said faceplate perimeter; and

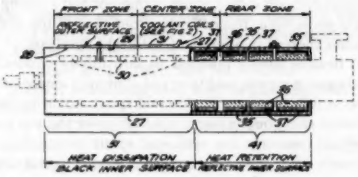
(n) a caulk bead extending around said faceplate margins and forming a water-tight seal.

4,548,341

PLASTIC INJECTOR WITH HEAT CONTROL

Robert J. Hambleton, Keithville, La., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Nov. 2, 1983, Ser. No. 548,116
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—146.6 **7 Claims**



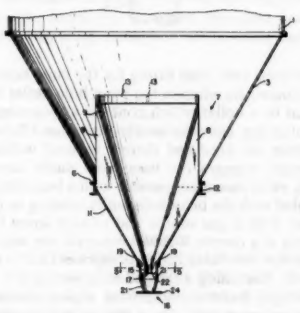
1. The improvement in a plastic injector apparatus comprising an axially extending barrel having a bore extending axially therethrough, and having a radial passage formed therein at the back end thereof for introducing solid plastic resin into said bore, an injection nozzle for injecting into receiving means amounts of melted resin accumulated in the front end of said bore, an axially reciprocable screw received in the rear opening of said bore and rotatable therein to work said introduced resin so as to heat it while advancing it forwards to said front end of said bore, and a plurality of heater bands ringing and axially spaced over the length of said barrel to provide supplemental heat for heating said resin, in which said improvement comprises: annular thermal insulating means comprising insulative material insulating against conductive and convective heat flow and disposed around and outside first heater bands ringing a rear section of the length of said barrel to impede radially outward flow of heat from said first bands, said insulating means being absent forward of said rear section, and annular uninsulating enclosure means disposed around and outside second heater bands ringing a forward section of the length of said barrel, said uninsulated enclosure means comprising at least part of an uninsulating cover containing and surrounding at least said forward section and having heat-absorptive and heat reflective surfaces registering with said forward section and disposed on, respectively, the inside and outside of said cover to promote radially outward flow of heat from said second heater bands through said cover.

4,548,342

FLOW CONTROL INSERT FOR HOPPER BOTTOM BINS

Glen W. Fisher, Bellevue, Wash., assignor to Technovators, Inc., Seattle, Wash.

Filed Apr. 11, 1983, Ser. No. 483,656
Int. Cl.[4] B65D *88/28*
U.S. Cl. 222—145 **17 Claims**



13. A device for controlling the flow of a solid material through a bin having a hopper with means forming an opening at its lower end comprising:

a first tapered channel forming means extending into the lower portion of the hopper for dividing the lower portion of the hopper into a central channel and a unitary peripheral channel through which the material will move in mass flow, said first tapered channel forming means being insertable up through said opening and positionable in proximity to the lower end of said hopper for receiving and discharging material therethrough, said first tapered channel forming means being sufficiently steep to promote gravity mass flow of material;

a second tapered channel forming means for forming extensions of said central and peripheral channels below said hopper opening through which the material will move in mass flow, said second tapered channel forming means being open at the top and bottom ends thereof with said top end conforming to said hopper opening and mountable thereto in surrounding relation to said first tapered channel forming means to receive material flowing between said first tapered channel forming means and the walls of said hopper;

means for dividing said extension of said peripheral channel into a plurality of segregated portions, said dividing means including a plurality of webs mounted on and extending outwardly from said first tapered channel forming means to said second tapered channel forming means, and insertable up through said hopper opening, whereby said webs and said second tapered channel forming means define a

plurality of segregated portions of said peripheral channel around a central channel defined by said first tapered channel forming means.

4,548,343

CONTAINERS FOR BEVERAGES

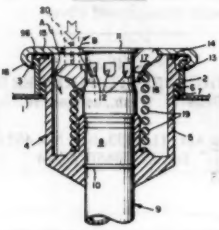
Henry Gotch, Sunbury, England, assignor to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Filed Jul. 5, 1983, Ser. No. 510,916

Claims priority, application United Kingdom, Jul. 7, 1982, 8219688

Int. Cl.⁴ B65D *83/14*

U.S. Cl. 222—400.7 **22 Claims**



1. An extractor tube head fitting for the bung hole outlet of a beverage container, wherein the bung hole outlet housing is characterized by a collar which contains a projecting lip portion adjacent its top, and wherein the fitting has a liquid extractor tube within the head end thereof secured within a body which sealingly engages the bung hole outlet housing, the body having valve means cooperable with a head fitting which can be coupled with the bung hole outlet housing to pressurize the container from a gas source and extract liquid therefrom for dispensing at a remote location, wherein the improvement in said extractor tube head fitting comprises:

a. said body containing a flanged member;

b. said flanged member comprising a plate forming a top surface for receiving a head fitting and coupling therewith, and wherein the plate contains a central aperture which is closed by parts of the valve means;

c. said plate having a first rim to seat over and around the top outer periphery of said bung hole outlet housing, the rim being deformable to form a clenched engagement around and beneath the lip of the bung hole outlet housing; and

d. said plate further comprising a second rim spaced inwardly of and concentric with said first rim, the top of the bung hole outlet housing being engaged between the two rims;

e. whereby said clench of the first rim of said flanged member around and beneath said projecting lip portion serves to retain the body in the bung hole outlet housing and secure it against internal container pressure.

4,548,344

ADAPTOR ASSEMBLY FOR JERRY CANS AND STORAGE DRUMS

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Jun. 20, 1983, Ser. No. 505,713

Int. Cl.⁴ B67D *5/60*

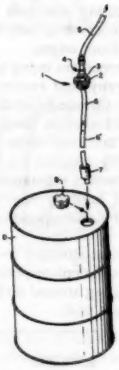
U.S. Cl. 222—464 **5 Claims**

1. An adaptor assembly usable with a plurality of different types of containers and in a plurality of different configurations comprising:

(A) a large diameter, container cap having a top and a bottom externally threaded tubular projection extending in axial alignment from opposite sides thereof the top threaded projection being of a lesser diameter than the bottom threaded projection and being provided with a tubular spout mounting projection, said spout mounting projection being disposed concentrically therein so as to project toward said bottom projection, and wherein the threads of the bottom projection are adapted for mating with at least a first type of standardized container opening;

(B) a tubular spout sized and shaped for retention within said spout mounting projection in a manner permitting slideable movement theref between a retracted position, wherein said spout projects outwardly from the bottom projection of the container cap, and a pouring position, wherein said spout projects outwardly from the top projection of the container cap, and for detachment from container cap;

(C) a small diameter, coupling cap having an internally threaded peripheral wall extendng axially from a top wall thereof, the threading of said peripheral wall being sized and shaped for threadingly seating said coupling cap upon the threads of the top projection of said container cap and for mating with at least a second type of container, and said top wall having an aperture extending concentrically



therethrough with a pump connector and a tubing connector projecting, respectively, from each of top and bottom sides thereof in alignment with said aperture;

(D) flexible tubing coupled to said tubing connector by a clamping means, said tube and clamping means being sized so as to be received within said spout mounting projection when said coupling cap is seated upon the top projection of the container cap with said spout detached;

wherein said container cap and tubular spout are usable together in a first configuration of said adapter assembly for pouring of fluids from at least said first type of container, wherein said container cap and said coupling cap are usble together in a second configuration of said adapter asembly for drawing of fluids from at least said first type of container, wherein said coupling cap is usable without said container cap in a third configuration of said adapter assembly for drawing of fluids from at least said second type of container and wherein a closure cap from at least said second type of container is usable with said container cap for sealing of at least said first type of container.

4,548,345
AUTOMATIC RIVETING MACHINE

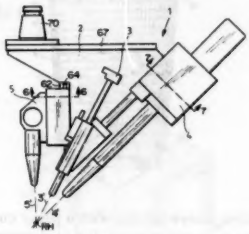
Wolfgang Puritz, Buxtehude, and Wilhelm Lengen, Rosengarten/Sieversen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,339

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232093

Int. Cl.⁴ B21J *15/12, 15/14, 15/18*

U.S. Cl. 227—58 **10 Claims**



1. A riveting apparatus for riveting components which are difficult to reach, comprising mounting bracket means (2), component guide means (15, 66; 65; 64) operatively supported by said mounting bracket means (2), operating components (3, 4, 5) comprising drilling feed advance means (5) movably mounted on a respective guide (64) of said component guide means, sensor means forming part of said drilling feed advance means (5) for sensing a part to be riveted, rivet supply means (3) operatively mounted on a respective guide (66) of said component guide means, and riveting means (4) operatively mounted on a respective guide (65) of said component guide means, said apparatus further comprising attachment means (70) carried by said mounting bracket means (2) for securing said mounting bracket means (2) with all operating components (3, 4, 5) carried by the mounting bracket means to another apparatus, and plug-in type control and power supply connector means (68, 69) carried by said mounting bracket means (2) for providing the required control and power supply to said operating components (3, 4, 5), and wherein each of said operating components (3, 4, 5) has a longitudinal axis (3', 4', 5'), said component guide means (15, 65, 64) being so located on said mounting bracket means (2) that said longitudinal axes (3', 4', 5') substantially converge toward a rivet hole (RH).

4,548,346
DUAL LINE PRODUCTION SYSTEM AND METHOD

Josef Kraus, Neusäss, and Karl-Heinz Klein, Augsburg, both of Fed. Rep. of Germany, assignors to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Apr. 14, 1983, Ser. No. 474,544

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209222

Int. Cl.⁴ B65G *47/00;* **B23K** *37/04*

U.S. Cl. 228—47 **7 Claims**

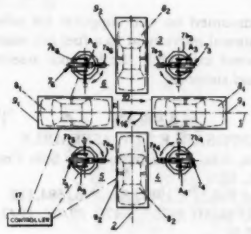
1. A production system comprising:

first conveyor means for displacing a first succession of workpieces in a first transport direction along a first conveyor path past a work station in steps;

second conveyor means for displacing a second succession of workpieces in a second transport direction generally perpendicular to the first direction past the work station in steps along a second conveyor path crossing the first path at an intersection adjacent the work station synchronously and alternately with the first conveyor means so that as a workpiece of one succession stops adjacent the station the workpieces of the other succession are moving and vice versa;

a tool at the work station displaceable between a first position engageable with a workpiece of the first path and a second position engageable with a workpiece of the second path; and

control means connected between the tool and both conveyor means for displacing the tool between its first and second positions and thereby working from the station



alternately on the stopped workpieces with the tool with such synchronism that as a workpiece of one succession is being held stationary and worked on a workpiece of the other succession is being removed from adjacent the station in the respective transport direction and replaced with the following workpiece of the other succession.

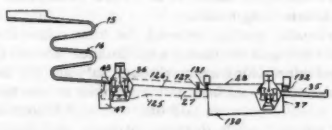
4,548,347
AUTOMATED FUEL PIN LOADING SYSTEM

David W. Christiansen, Kennewick; William F. Brown, West Richland, and Jim M. Steffen, Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,640

Int. Cl.⁴ G21C *3/02*

U.S. Cl. 228—48 **9 Claims**



1. In an automated loading apparatus for nuclear reactor fuel pins:

gravity conveyor means for rolling parallel fuel pin assemblies along an inclined path perpendicular to their lengths;

transversely movable transport means interposed in said path; said transport means including transversely spaced fuel pin supports for coaxially positioning a fuel pin assembly along a preselected operational axis;

transfer means movably mounted relative to both said conveyor means and said transport means for selectively engaging and moving individual fuel pin assemblies between said conveyor means and the supports of said transport means;

powered means mounted on said transport means for selec-

tively shifting the transport means relative to said conveyor means in a transverse direction that is parallel to said operational axis;

fuel pin handling means at a location transversely adjacent to one side of the conveyor means and intersected by said operational axis for selectively receiving one end of a fuel pin assembly shifted thereto by operation of said powered means; and

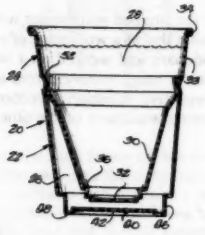
roller means mounted on said supports for selectively imparting rotational movement to a fuel pin assembly about said operational axis while the fuel pin assembly is positioned by said supports.

4,548,348

DISPOSABLE CUP ASSEMBLY

Jack D. Clements, Ada, Okla., assignor to Solo Cup Company, Highland Park, Ill.

Filed Feb. 27, 1984, Ser. No. 584,112
Int. Cl.[4] B65D *21/02*; A47G *19/03, 19/23*
U.S. Cl. 229—1.5 H **5 Claims**



1. A disposable cup assembly comprising:

an integral vacuum formed thermoplastic thin-walled liner having a sidewall of truncated substantially right circular conical shape and having a closed bottom wall, and

an integral vacuum formed thermoplastic thin-walled holder for receiving said liner said holder also having a sidewall of substantially truncated substantially right circular conical shape,

said liner and said holder each comprising an interlocking component together constituting releasable interlocking means for retaining a liner in said holder,

the sidewall of said liner having a greater angle of convergence with its axis than does the sidewall of said holder, to form a thermally insulative air pocket beneath the level of said interlocking means,

the horizontal spacing between the liner sidewall and the holder sidewall increasing with distance beneath the level of said interlocking means through substantially the entire coextension of said liner and said holder so that the rate of heat transfer between said liner and said holder is generally reduced with distance beneath said interlocking means, said horizontal spacing being significantly greater than the thickness of the holder wall throughout substantially the entire coextension of said liner and said holder,

said holder terminating at the level of said interlocking means and said liner extending thereabove so that said liner and said holder can be easily separated;

said holder has a substantially closed bottom wall and wherein said holder bottom wall is spaced from that of said liner whereby said air pocket surrounds the entire outside surface of said liner beneath the level of said interlocking means,

when said holder and said liner are mated, the portion of said liner beneath the level of said interlocking components hangs pendent, fully encompassed by said air pocket and out of contact with said holder,

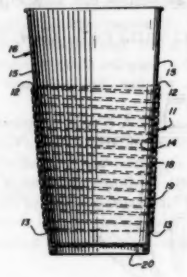
said holder being substantially symmetrical about any plane containing its axis so that a plurality of said holders substantially fully telescopically nest to form a stack.

4,548,349

PROTECTIVE SLEEVE FOR A PAPER CUP

Robert A. Tunberg, Moline, Ill., assignor to Whitey's Ice Cream Manufacturers, Inc., Moline, Ill.

Filed Apr. 3, 1984, Ser. No. 596,286
Int. Cl.[4] A47G *19/22*; A47J *45/10*
U.S. Cl. 229—1.5 H **3 Claims**



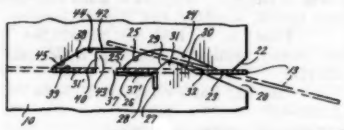
1. A protective sleeve for use with a paper cup and a mixing apparatus by an operator in preparing confectionary drinks and for protecting the paper cup against puncturing and the operator against injury from the mixing apparatus, said sleeve comprising a hollow cylinder for receiving and holding the paper cup, said cylinder being tapered and providing a press fit with said cup when the ingredients of the confectionary drinks are placed in said cup, said cylinder having a length sufficient to surround a substantial linear extension of the cup when the cup is inserted into said sleeve, said cylinder also having opposite annular end portions, a substantially smooth, tapered inner surface adapted to engage and abut against the outer surface of said cup over a substantial linear extension of said cup and to provide structural support and puncture resistance for the cup area contacted by said smooth inner surface and rigidity to the cup area not contacted by said smooth inner surface, and an outer surface with a groove means cut into said outer surface and covering essentially said out surface forming a roughened portion for enabling the operator to securely grip said sleeve.

4,548,350

INTERLOCK ON COLLAPSIBLE CROSS PARTITIONS

Donald W. Engle, North Prairie, and Roger S. Hahn, Germantown, both of Wis., assignors to Rock-Tenn Company, Norcross, Ga.

Filed May 16, 1984, Ser. No. 610,701
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—15 **10 Claims**



1. In a partition strip of the kind described adapted to interengage with a corresponding partition strip to make a divider for cartons and the like; means providing a hinge line on the partition strip including a slot extending inwardly from one edge of the partition strip and shaped to provide a tab projecting laterally of the hinge line, the slot terminating short of the opposite edge of the partition strip, an opening spaced from the slot along the hinge line, the opening providing a locking edge and an edge laterally of the hinge line, the opening having a slit spaced from the hinge line and extending toward the initial edge of the partition strip and adapted to provide a yieldable

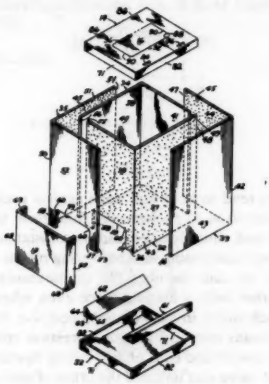
lug portion in the partition strip between the slot and the opening.

4,548,351

REMOVABLE ACCESS DOOR ON BULK CONTAINER HAVING MULTIPLE LAYER WALLS

Perry Gusic, 3750 W. Main, Suite AA-4065, Norman, Okla. 73069

Continuation-in-part of Ser. No. 410,215, Aug. 23, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 603,530
Int. Cl.[4] B65D *5/32*
U.S. Cl. 229—23 R 4 Claims



1. A bulk material container, comprising:

a normally upright multiple wall thickness sleeve formed by a pair of double wall thickness inner panels and a pair of double wall thickness outer panels defining sleeve side and end walls,

each pair of panels of said pairs of inner panels and outer panels comprising a side panel and an end panel integrally joined together along a vertical fold line with each panel having a respective vertical free edge surface opposite the fold line,

said side and end panels of each pair of inner panels being contiguously bonded flatly to corresponding side and end panels of said pair of outer panels with one of the free vertical edge surfaces of said pair of inner panels and said pair of outer panels disposed in parallel spaced-apart relation to others of the free vertical edge surfaces of said pair of inner panels and said pair of outer panels respectively a distance substantially equal to the wall thickness of the respective side or end panel of said inner and outer pairs of panels,

one said sleeve wall having a cutout in its lower edge portion forming a door dispensing opening;

a bottom cap having a bottom panel with upstanding corresponding side and end panels connected thereto along bottom fold lines and disposed in adjacent overlying relation on the sleeve side and end walls;

a door cover spanning the door opening and overlapping the outer surface of the depending end portion of said one sleeve wall around the door opening therein; and,

at least one strap normally surrounding said sleeve and said door cover,

said door cover being moveable, as a unit, laterally of said one sleeve wall for uncovering the door opening upon removal of said strap,

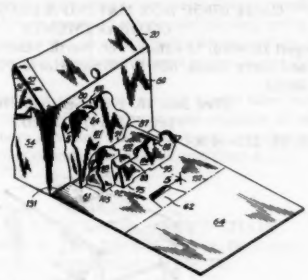
whereby said sleeve may be flatly collapsed after removal of said strap and said bottom cap.

4,548,352

POP-OUT CARTON

James L. Capo, Middletown, Ohio, and William D. Cunningham, Rocky Mount, N.C., assignors to International Paper Company, New York, N.Y. and Hardee's Food Systems, Inc., Rocky Mount, N.C.

Filed Jan. 20, 1984, Ser. No. 572,444
Int. Cl.[4] B65D *5/72*
U.S. Cl. 229—17 G 6 Claims



1. A unitary blank for forming a folding carton comprising:

a. a pair of sidewall panels, the first sidewall panel having a free edge;

b. a pair of endwall panels, the first endwall panel joined to the first and second sidewall panels;

c. a first bottom panel joined to the first sidewall panel;

d. an auxiliary side panel of the same width as the first bottom panel joined to the first bottom panel and foldable normal to the first bottom panel to form an auxiliary sidewall upon erection of the blank into a carton;

e. a pair of roof panels joined to the sidewall panels and surmounted by upper rib panels with openings therein, the rib panels mating face-to-face upon erection of the carton blank to form a handle;

f. a triangular bottom tuck-out flap, notched at its apex, joined to the first end wall panel;

g. a triangular bottom glue flap joined to the bottom tuck-out flap and attachable to the outer face of the first bottom panel so as to pull the first bottom panel into position upon erection of the carton blank;

h. a trapezoidal bottom tuck-out flap joined to the second end wall panel;

i. a trapezoidal bottom panel joined to the second sidewall panel;

j. a second bottom glue flap joined to the trapezoidal bottom panel and attachable to the trapezoidal bottom tuck-out flap so as to pull the tuck-out flap into position upon erection of the carbon blank;

k. a first bow-in panel joined at score lines to the first and second roof panels and joined by score lines and perforated cut lines to the first end wall panel so as to bow in beneath the roof panels upon erection of the carton;

l. a second bow-in panel joined at score lines to the second roof panel and to a side seam panel and joined by score lines and perforated cut lines to the second endwall panel so as to bow-in beneath the roof panels upon erection of the carton;

m. the side seam panel attachable to the outer surface of the first roof panel to form a flattened tube;

n. a first pop-out panel formed as an extension of the side seam panel, of a size substantially equal to a sidewall panel and attachable to the outer surface of a sidewall panel;

o. a second pop-out panel hingedly connected to the first pop-out panel and foldable against a surface of the first pop-out panel;

p. a fold-out panel hingedly connected to the second pop-out

panel, foldable against a surface of the second pop-out panel and attachable to the roof panel surmounting the sidewall panel to which the first pop-out panel is attachable; and

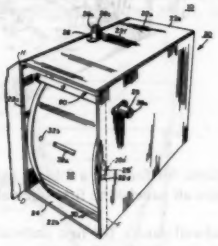
q. the first and second pop-out panels having partially cut lines and score lines defining a three-dimensional scene collapsed upon the surfaces of the first and second pop-out panels.

4,548,353

CASH DROP BOX HAVING A PLURALITY OF COMPARTMENTS

Robert Howard, 73 Estates Ter. North, Manhasset, N.Y. 11030, and Jerry Knoll, 628 W. White Horse Pike, Cologne, N.J. 08213

Filed Jan. 16, 1984, Ser. No. 570,841
Int. Cl.[4] A47G *29/00*
U.S. Cl. 232—4 R **27 Claims**



1. A multi-compartment container for receiving and storing currency and the like comprising:

a hollow container rotatable about its central axis;

divider means for dividing the container into a plurality of compartments;

said container having a plurality of access openings each for gaining access to an associated compartment;

a plurality of plates, each being arranged in a compartment, each movably mounted relative to said container for releasably sealing an associated one of said access openings;

locking means for releasably locking each plate in the closed position;

a plurality of insertion slots in said container each associated with one of said compartments;

a hollow housing for removably receiving said container and having a common insertion slot;

means for rotatably supporting said container in said housing for selectively aligning one of said insertion slots with said common insertion slot;

a plurality of detent receiving means on said container each associated with one of said compartments; and

detent means on said housing movable into engagement with one of said detent receiving means, releasably retaining the insertion slot aligned with said common slot when said detent is in a first position, engaging one of said detent receiving means and for releasing said container to rotate in said housing when said detent means is in a second position displaced from said container.

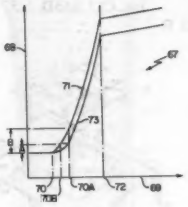
4,548,354

VEHICLE-TYPE THERMOSTAT CONSTRUCTION AND METHOD OF MAKING THE SAME

Joseph P. Wagner, Knoxville, and Boyd P. Sliger, Concord, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 26, 1984, Ser. No. 593,386
Int. Cl.[4] F01P *7/02*
U.S. Cl. 236—345 **20 Claims**

4. In a single valve vehicle-type thermostat construction comprising a temperature responsive device having a piston member and a cylinder member that are adapted to provide relative movement therebetween when said device senses certain temperatures, a single valve seat unit being operatively interconnected to one of said members, a single valve closure unit being operatively interconnected to the other of said members and being adapted to control fluid flow through said valve seat unit in relation to the position of said valve closure unit relative to said valve seat unit as determined by the temperature being sensed by said device, and spring means operatively interconnected to one of said members and to one of said



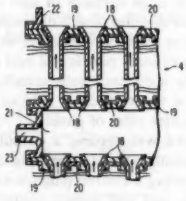
units to always tend to hold said units against each other in a closed condition so as to prevent any fluid flow through said valve seat unit and, thus, through said thermostat construction, the improvement comprising another spring means operatively interconnected to said members to continuously urge said members together with a loading force even when said units are against each other in said closed condition thereof, said other spring means comprising a compression spring having opposed ends, one of said ends of said spring operatively bearing against said valve seat unit and the other of said ends of said spring operatively bearing against said piston member.

4,548,355

DEVICE FOR REGULATING HEATING CAPACITY OF A HEAT EXCHANGER

Albert Stolz, Tübingen; Wolfgang Volz, Magstadt, and Günther Sigmund, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 28, 1980, Ser. No. 172,945
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930747
Int. Cl.[4] F28F *27/00*
U.S. Cl. 236—37 **14 Claims**



1. A device for regulating heat output of a heat exchanger of a motor vehicle, the device includes an actuating means for controlling a flow of heat exchange medium through the heat exchanger, and a control means for operating the actuating means in response to predetermined input signals, characterized in that the heat exchanger is a tubular heat exchanger, and in that the actuating means is an electromagnetically operated valve arranged downstream of the heat exchanger, said valve is constructed so as to be in an open condition when the electromagnet is unenergized,

that each tube of the tubular heat exchanger terminates in a

tube end, and in that each tube end is closed off by a tube bottom portion embedded in an elastic material, and

the heat exchanger is subdivided by at least one intermediate tank into two successive zones having different temperature levels, and in that means are provided at the intermediate tank for permitting only minor heat exchange.

4,548,356

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

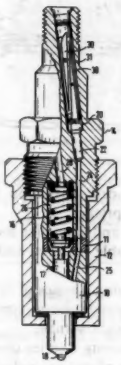
Karl Hofmann, Remseck, and Erich Jäger, Korb, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

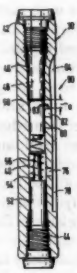
Filed Aug. 12, 1983, Ser. No. 522,766

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237932

Int. Cl.⁴ B05B *9/00*

U.S. Cl. 239—126 **12 Claims**





1. A fuel injection nozzle for internal combustion engines, said fuel injection nozzle including a nozzle holder, a nozzle body including an injection valve, a fuel flow conduit in said nozzle holder to said nozzle body and injection ports within said nozzle body, a fuel inlet conduit in said nozzle holder, a filter body inserted into said fuel inlet conduit in said nozzle holder, said filter body includes a longitudinal bore which extends axially through the filter body from an upper fuel inflow end and in which said longitudinal bore is closed off at its lower end by an end closure means;

a hollow screw means inserted into said upper fuel inflow end of said longitudinal bore, said hollow screw means having a bore extending all the way therethrough from end to end, a check valve in said longitudinal bore in said filter body between said hollow screw means and said end closure means, said check valve includes a closure member embodied as a relief piston which moves in a direction of fuel flow to permit fuel flow from said fuel inlet conduit into said longitudinal bore via said check valve and through a transverse bore in said filter body into an annular chamber along-side said filter body and through said fuel flow conduit in said nozzle holder to said injection valve, said hollow screw means includes an end face which forms a stop for said closure member of said check valve;

a closing spring disposed in a segment of said longitudinal bore that extends downstream from said closure member to said end closure means in which said closing spring is supported between said closure member at one end and on its other end by said lower end closure means of said filter body, and

a tranversely disposed relief bore formed in said filter body which permits fluid flow between said segment of said longitudinal bore in which said closing spring is disposed and said annular chamber along-side said filter body.

4,548,357

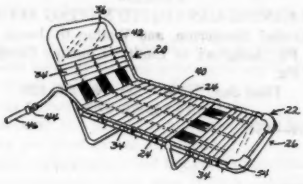
SPRINKLER DEVICE FOR A LAWN CHAIR

Ted F. Schmidt, 6538 N. Allen Rd. #75, Peoria, Ill. 61614

Filed Dec. 9, 1983, Ser. No. 559,742

Int. Cl.⁴ B05B *15/06*; A47C *7/72*

U.S. Cl. 239—289 **4 Claims**



1. Apparatus for sunbathing including a portable sprinkler device attached to a lawn chair or recliner having frame means including elongated side frame members, and cross frame members at the head and foot ends respectively, said sprinkler device comprising a unit including

a flexible hose closed at one end and having an on-off control valve at the opposite end and being of sufficient length to end in a "U"-configuration including side legs along said side frame members, and a crossover leg interconnecting the side legs and extending at right angles thereto across one end of the frame means;

quickly attachable and detachable means for fastening said side legs to said side frame members;

a pair of 90° elbow guide fittings engaging the hose at the corners where the ends of the crossover leg join the side legs, said elbow guide fittings constraining the hose to a 90° bend at each corner against twisting and bending;

a plurality of water-emitting sprinkler apertures in said hose directed toward the center of the frame means;

whereby a person may sunbathe on said furniture beneath water sprays from said sprinkler apertures to thereby enhance the tanning effect of solar rays while maintaining a comfortable body temperature.

4,548,358

MULTIPLE PIECE CUTTING TIP

Robert A. Fischer, 1903 Ave. C., Katy, Tex. 77449

Filed Oct. 27, 1983, Ser. No. 546,029

Int. Cl.⁴ B05B *1/34*

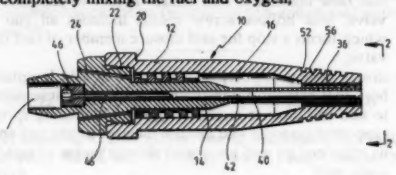
U.S. Cl. 239—424 **5 Claims**

1. A cutting tip for attachment to the head of a cutting torch comprising,

an outer body,

an inner body coaxially positioned in the outer body and forming a first passageway positioned between the inner and outer bodies for transmitting preheat fuel and oxygen therethrough,

a helical mixer positioned in the first passageway for more completely mixing the fuel and oxygen,



said first passageway including a plurality of openings about the inner body at the tip end of the first passageway for preheating,

said inner body having a second passageway therethrough for the passage of cutting oxygen, and

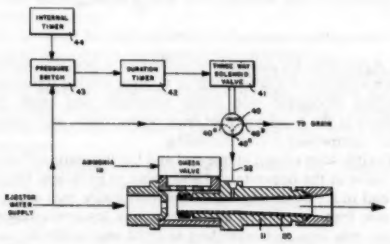
releasable and replaceable adapter means connected to and extending into the inner body for adjusting the cross-sectional area of the second passageway.

4,548,359

SELF-CLEANING GAS-LIQUID MIXING APPARATUS

John E. Kriebel, Souderton, and Walton B. Jones, Richboro, both of Pa., assignors to Capital Controls Company, Inc., Colmar, Pa.

Filed Jun. 2, 1983, Ser. No. 500,527
Int. Cl.⁴ B05B *7/04*
U.S. Cl. 239—434 **20 Claims**



1. Apparatus for mixing with a first flowing medium a second medium tending to form solid mattern having a proclivity to precipitate in the zone of mixing, said apparatus comprising:

a throat member having a through bore with an upstream end and a downstream end,

first inlet means adjacent the upstream end of said throat member for flowing said first medium into said throat member bore,

second inlet means between said first inlet means and said upstream end of said throat member for introducing said second medium into said first medium,

an elastic tubular liner extending lengthwise in said throat member bore,

means at opposite ends of said throat member securing said tubular liner in said throat member bore and defining an expandable chamber between the outer periphery of said liner and the inner periphery of said throat member bore with said chamber completely surrounding said liner between said throat member ends, and

means for alternately admitting into and exhausting from said chamber a working fluid adapted to flex said liner periodically for stretching the liner inwardly and constricting flow through said throat and thereby increasing pressure of said first medium upstream of said first inlet means, means upstream of said first inlet means for sensing said increase in pressure, and means cooperable with said pressure sensing means to exhaust said working fluid from said chamber when a predetermined pressure level is sensed,

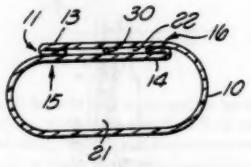
whereby any precipitate forming on the inside of the throat liner is loosened and exfoliated into the mixed mediums flowing through the throat.

4,548,360

MULTICHAMBER DRIP IRRIGATION HOSE

Daniel W. C. Delmer, Baywood Park, and William A. Delmer, Huntington Beach, both of Calif., assignors to William W. C. Delmer, Huntington Beach, Calif.

Continuation of Ser. No. 346,592, Feb. 8, 1982, abandoned. This application May 22, 1984, Ser. No. 613,741
Int. Cl.⁴ B05B *15/00*
U.S. Cl. 239—542 **21 Claims**



21. A multichamber drip irrigation hose for distributing water and the like, comprising

a larger primary tube and a smaller secondary tube of flexible water impermeable material and joined at a common wall,

said common wall having a series of first passages facing the interior of said primary tube in communication with the interior of said secondary tube,

said secondary tube having a series of second passages leading from the interior of said secondary tube to the exterior,

with said tubes comprising a single strip of said material as the sole structure of said tubes, said strip having first and second opposite edges with said first edge folded on itself with a 180° bend to form a thicker first edge,

with said strip folded and bonded to said thicker first edge along a line spaced from said second edge and bonded to itself at said second edge along a line spaced from said thicker first edge to form said primary and secondary tubes with said thicker first edge comprising the structure spacing said strip from itself, and

flap means in said secondary tube dividing said secondary tube into a plurality of discrete chambers, each chamber having at least one first passage and one second passage, said flap means comprising a flap formed by slitting said common wall, with said flap raised from said common wall to contact said secondary tube opposite said common wall and define said discrete chambers.

4,548,361

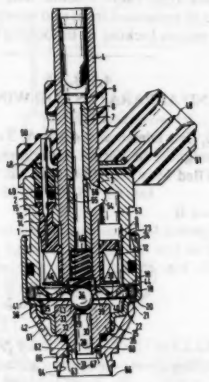
FUEL INJECTION VALVE

Werner Paschke, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,185
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300511
Int. Cl.⁴ F23D *13/28*; **B05B** *15/02, 1/30*
U.S. Cl. 239—585 **1 Claim**

1. A fuel injection valve including a nozzle body which extends into a front attachment a valve seat in said nozzle body, a preparation bore in said nozzle body which terminates at a sharp-edged nozzle body end in a direction of fuel flow, a first conical zone tapering from the circumference of said

nozzle body toward the preparation bore at the nozzle body end, a cylindrical guide conduit in said front attachment, a first conical zone of the nozzle body protrudes into said cylindrical guide conduit, said cylindrical guide conduit including a sharp-edged first guide conduit end which is located at a second



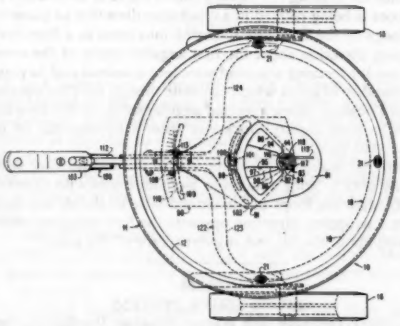
conical zone in said front attachment which tapers toward said cylindrical guide conduit and discharges into a guide conduit in said front attachment embodied with a larger cross section with an increasing diameter which widens in conical fashion, and said guide conduit leads to a sharp-edged second guide conduit end.

4,548,362

MATERIAL SPREADER

Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Dec. 29, 1983, Ser. No. 566,536
Int. Cl.[4] A01C *17/00*
U.S. Cl. 239—685 **7 Claims**



6. A material spreader for spreading material in a specific pattern at a selected flow rate including:

a hopper for containing material to be spread;

support means to support said hopper for movement along the ground through either pushing or pulling;

spreading means disposed beneath said hopper to receive material for spreading;

rotating means to rotate said spreading means at a selected rate of rotation as said support means is moved along the ground;

said hopper having an opening in its bottom for material to flow therethrough from said hopper to said spreading means;

control means to control the portion of said opening in said hopper through which the material flows;

said control means including:

first means pivotally mounted for movement about a pivot axis to control the portion of said opening in said hopper that is open for material to flow therethrough from said hopper to control the spread pattern;

and second means pivotally mounted for movement about the pivot axis to control the size of the portion of said opening in said hopper that is open by the position of said first means to control the flow rate therethrough;

said first means comprising a gate having an opening therein of a selected size smaller than said opening in said hopper, said gate being mounted for pivotal movement about the pivot axis to move said opening in said gate relative to said opening in said hopper to control the spread pattern of material from said hopper by controlling the portion of said opening in said hopper through which the material flows;

said second means comprising a shutter having an opening therein of a selected size smaller than said opening in said gate, said shutter being pivotally mounted for pivotal movement about the pivot axis independently of said gate to move said opening in said shutter relative to said opening in said gate to control the rate of flow of material from said hopper through said opening in said gate;

limiting means to limit pivoting of said gate about the pivot axis;

holding means to hold said shutter in the position to which it is moved while preventing pivoting of said shutter about the pivot axis beyond a desired limit;

said limiting means including:

a first arcuate slot in said gate formed on a first radius having the pivot axis as its center;

and means supported by said hopper and disposed in said first arcuate slot in said gate to limit pivoting of said gate about the pivot axis to the arcuate length of said first arcuate slot in said gate;

said holding means including:

a second arcuate slot in said gate formed on a second radius having the pivot axis as its center;

and means supported by said gate and disposed in said second arcuate slot in said gate, said supported means being selectively movable to any portion of said second arcuate slot in said gate and being retained at any position to which it is moved;

and means carried by said shutter and disposed in said second arcuate slot in said gate to engage said supported means in said second arcuate slot in said gate so that said shutter is held in the position ot which it is moved while pivoting of said shutter about the pivot axis beyond a desired limit is prevented.

4,548,363

MUZZLE FOR ELECTROSTATIC SPRAY GUN

Charles M. McDonough, Stamford, Conn., assignor to PCF Group, Inc., Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,493
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—698 **15 Claims**

1. A muzzle for use in an electrostatic spray gun comprising:

an insulating tube having a rear end adapted to be mounted in an electrostatic spray gun and a front end providing an exit for coating material;

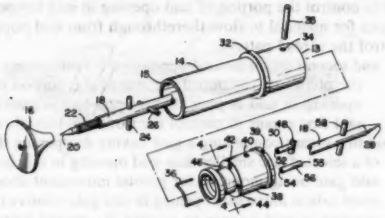
a conductive rod mounted axially within said tube;

a conductive pin extending radially from said rod at one end thereof; and

means for electrically connecting said pin to a power terminal when the rear end of said insulated tube is mounted in a spray gun including:

an end plug mounted at the rear end of said insulating tube;

a first electrical contact in said end plug adapted to engage a corresponding power terminal in an electrostatic spray gun; and



a second electrical contact in said end plug connected to said first electrical contact and adapted to engage said radially extending conductive pin, wherein said end plug includes a groove to accommodate said radially extending pin, and said second electrical contact comprises a conductive member lining said groove.

4,548,364

WINDING MACHINE WITH EXCHANGEABLE CASSETTE FOR A WIRE MAGAZINE

Jan B. Pedersen, Hvalso, Denmark, assignor to Tortrix A/S, Denmark

PCT No. PCT/DK80/00058, § 371 Date May 13, 1981, § 102(e) Date May 13, 1981, PCT Pub. No. WO81/00841, PCT Pub. Date Apr. 2, 1981

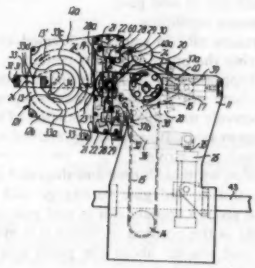
Continuation of Ser. No. 268,995, May 13, 1981, abandoned.

This PCT application Sep. 18, 1989, Ser. No. 538,368

Claims priority, application Denmark, Sep. 24, 1979, 3969/79

Int. Cl.[4] H01F *41/08;* B65H *81/02*

U.S. Cl. 242—4 B **17 Claims**



9. A winding machine for the winding of core members, said machine comprising:

a base element, comprising:

a machine frame;

a lockable receptor means mounted on said machine frame;

actuator means mounted on said machine frame for locking said receptor means, said actuator means including means for selective manual operation;

a removable section comprising:

a wire holder in the form of an openable, annular, two-part magazine for supply of winding material, said magazine having a slit for drawing out winding material;

a magazine holder having two pivotally connected parts, each of said pivotally connected parts including guide means for suspending said magazine for rotation around its own axis of revolution;

interlocking means formed on said magazine holder, said interlocking means being formed to mate with said receptor means, to be held to said receptor means when said receptor means is locked, and to be released from said receptor means when said receptor means is unlocked so as to separate said removable section from said base element;

wherein said removable section may be selectively connected to or separated from said base element through said actuator means locking or unlocking said receptor means.

4,548,365

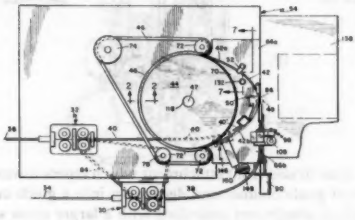
METHOD AND APPARATUS FOR WINDING TOROIDAL CORES

Willy Marzec, San Diego, and Allen A. Tallis, Oceanside, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed May 15, 1984, Ser. No. 610,448

Int. Cl.[4] H01F *41/08*

U.S. Cl. 242—4 R **8 Claims**



1. An apparatus for winding a pair of wires onto a toroidal core having a central opening and an axis which extends through the opening, comprising:

means for supporting and selectively rotating a core about its central axis in a first direction designated clockwise and in a second direction designated counterclockwise;

means for forming a first wire into a first coil having a plurality of loops which circulate through the core opening in a position along a first angular sector of the core that is located slightly counterclockwise from a trailing end of the first wire;

means for braking the trailing end of the first wire while the core is being rotated in a clockwise direction to cause the loops of the first wire to shrink into turns in a first wrapping direction about the first angular sector of the core;

means for forming a second wire into a second coil having a plurality of loops which circulate though the core opening in a position along a second angular sector of the core that is located slightly clockwise from a trailing end of the second wire;

means for braking the trailing end of the second wire while the core is being rotated in a counterclockwise direction to cause the loops of the second wire to shrink into turns in a wrapping direction opposite the first wrapping direction about the second angular sector of the core.

4,548,366

CHUCK DRIVE SYSTEM

Armin Wirz, Ossingen, and Werner Nabulon, Ruedlingen, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 17, 1982, Ser. No. 379,134

Int. Cl.[4] B65H *54/02, 54/40*

U.S. Cl. 242—18 DD **24 Claims**

1. A winding machine for winding thread into a package comprising:

at least one chuck for supporting a thread package;

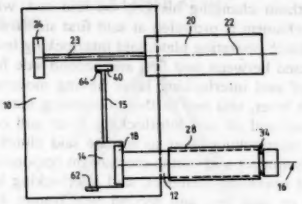
a motor connected to said chuck for driving the chuck into rotation about a longitudinal chuck axis;

a friction roll for contacting the circumference of a thread package on said chuck;

means for driving said roll into rotation about a longitudinal roll axis;

means or causing relative movement of said chuck and said roll towards and away from each other along a path extending generally transversely of said axes; and

means independent of said motor for limiting said relative



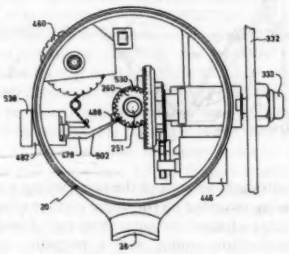
movement of said chuck and said roll towards each other to leave a space between said chuck and said roll at completion of said relative movement of said chuck and said roll towards each other.

4,548,367

BAIT CLICKER FOR FISHING REEL

Richard R. Councilman, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 5, 1983, Ser. No. 539,312
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.51 R **13 Claims**



1. In a fishing reel of the type having a housing, a rotatable shaft carried by the housing, a toothed member associated by the housing, a toothed member associated with the shaft for rotation in response to movement of the rotatable shaft, and a bait clicker mounted in a bore in the housing which, in contact with the toothed member, provides an audible clicking sound upon rotation of the toothed member, the bait clicker comprising:

a control knob situable externally of the reel housing;

a body portion integrally formed with the control knob;

means for mounting the body portion for rotation within the bore; and

a resilient finger integrally formed with the body portion and selectively directly engageable with and disengageable from the toothed member upon rotating the body portion in the bore, said finger reacting with the toothed member to produce a clicking sound to alert a user to rotation of the toothed member.

4,548,368

WIRE CADDY

Thomas L. Tomlinson, 5210 Bluff Rd., Indianapolis, Ind. 46217

Filed Aug. 25, 1983, Ser. No. 526,476
Int. Cl.[4] B65H *59/16*
U.S. Cl. 242—129.6 **5 Claims**

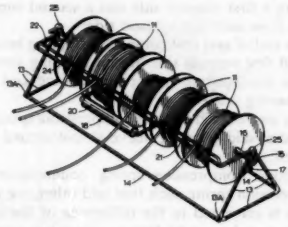
1. A wire caddy for carrying one or more wire spools, comprising:

a base;

a rod mounted to said base, said rod rotatably receiving thereon said one or more wire spools;

a handle pivotally attached to said base; and

a means for braking the unwinding of said one or more wire spools, said braking means attached to said handle and pivotable therewith from a lowered position in frictional engagement with said one or more wire spools, said braking means pivoting on an axis which is offset from and



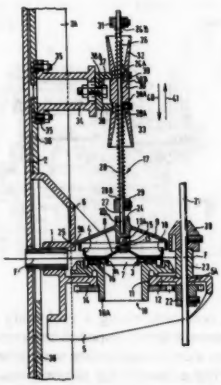
vertically above the axis of said rod, said braking means including one or more elongated wire guides adapted to guide the unwinding of wire from said one or more wire spools, whereby, when wire from said one or more wire spools is unwound from an upwards direction, said braking means engages said wire through said elongate guides, said braking means frictionally engaging said one or more wire spools so as to brake spool rotation when tension on said wire ceases.

4,548,369

THREAD TENSIONING APPARATUS FOR WARP CREEL

Erwin Bossart, Flawil, Switzerland, assignor to Maschinenfabrik Benninger AG, Uzwil, Switzerland

Filed Apr. 22, 1985, Ser. No. 725,637
Claims priority, application Switzerland, May 3, 1984, 2153/84
Int. Cl.[4] B65H *59/22*
U.S. Cl. 242—150 R **14 Claims**



1. A thread tensioning apparatus for use in a warp creel, especially in warp and beam warping installations, comprising:

at least one pair of brake plates;

one of said brake plates being mounted for rotation about its axis and in an axially stationary manner;

an other one of said brake plates bearing upon said one brake plate in a peripherally centered manner and being approximately centered relative thereto;

at least one adjustable tensioning device centrally acting upon said other one of said brake plates;

said adjustable tensioning device pressing said other one of said brake plates with a variable and adjustable pressure against said one of said brake plates;

said adjustable tensioning device comprising:

a pressing pin;

a first compression spring surrounding said pressing pin and having one end;

a gripping sleeve slideably mounted at said pressing pin and having a first support side and a second support side remote from said first support side;

said one end of said first compression spring being supported at said first support side of said gripping sleeve;

a second compression spring surrounding said pressing pin and having one end;

said one end of said second compression spring being supported at said gripping sleeve at said second support side thereof;

said second compression spring counteracting said first compression spring such that said other one of said brake plates is subjected to the difference of the spring forces originating from said first compression spring and said second compression spring;

a displaceable control plate extending substantially parallel to said pressing pin;

said gripping sleeve of said at least one adjustable tensioning device being operatively connected to said control plate; and

said control plate being displaceable and conjointly therewith said gripping sleeve being displaceable relative to said pressing pin such that said difference of said spring forces is continuously adjustable between a range of negative values of such difference and a range of positive values of such difference through a zero value of such difference.

4,548,370

FISHING REEL CLUTCH ACTUATOR

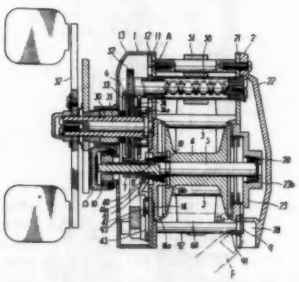
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 30, 1983, Ser. No. 567,056

Claims priority, application Japan, Jan. 8, 1983, 58-1208

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—211 **6 Claims**



1. A fishing reel comprising a reel body having first and second side frames, a spool disposed between said side frames at said reel body, a drive mechanism supported to said first side frame and having a handle for driving said spool, a clutch mechanism for freely rotating said spool with respect to said drive mechanism, and a clutch operating mechanism for operating said clutch mechanism, said clutch operating mechanism having an operating member and a clutch lever to disconnect said clutch mechanism responsive to pushing of said operating member, said clutch lever and said operating member being fixedly mounted on a first end of an interlocking lever and laterally supported solely to said second side frame opposite to said first side frame carrying said handle so that when said clutch lever is pushed to a termination position at which said clutch mechanism is disconnected, said operating member is positioned in close proximity to an outer surface of said spool, whereby a user can use his thumb of his hand which grips a rod to which said reel is attached to stop free rotation of said spool in continuation of pushing said operating member with said thumb without changing his grip on said rod, wherein said clutch mechanism is provided at said first side frame and includes a clutch operating plate, said interlocking lever is rotatably disposed between said first and second side frames, said first end of said interlocking lever having mounted thereon said clutch lever, said reel further comprising means disposed on a second end of said interlocking lever and cooperating with said interlocking lever to actuate said clutch operating plate to disconnect said clutch mechanism responsive to pushing of said operating members, said interlocking lever being journaled on said first and second side frames at positions intermediate said first and second ends of said interlocking lever, and wherein said second side frame comprises a recess for receiving said operating member when said clutch lever is pushed.

4,548,371

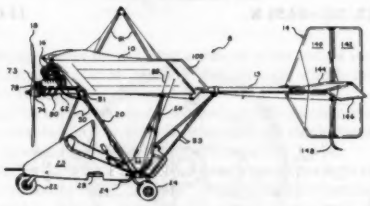
ULTRALIGHT AIRCRAFT

John M. Dempsey, East Longmeadow, Mass., assignor to Ultralight Flight, Inc., Mt. Airy, N.C.

Filed Jun. 11, 1982, Ser. No. 387,487

Int. Cl.⁴ B64C *3/26, 25/58;* **B64D** *27/00*

U.S. Cl. 244—13 **8 Claims**



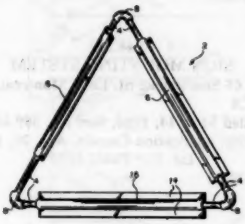
1. In an ultralight aircraft of the type having a unitary tubular keel, a wing mounted on the upper surface of said keel with its leading edge adjacent the outer front end of said keel, and an internal combustion engine and a propeller to be driven thereby, an improved cantilever mounting frame for supporting said engine and said propeller on said keel, said mounting frame comprising a pair of laterally spaced plates disposed along opposite exterior side surfaces of the keel and longitudinally extending forwardly of the front end of said keel, first reinforcing block members disposed between said plates and said side surfaces of said keel, said first block members having flat outwardly facing surfaces in mated surface-to-surface engagement with said plates and inwardly-facing concave surfaces in mated surface-to-surface engagement with said exterior side surfaces of said keel, second reinforcing block members disposed inwardly of said keel adjacent said first block members, said second block members having outwardly-facing convex surfaces in mated surface-to-surface engagement with opposite interior side surfaces of said keel, said first and second block members being formed of a relatively rigid, slightly compressible synthetic plastic material, said plates, said first and second block members and said keel having plural registered mounting holes, plural fasteners extending through said mounting holes to secure said plates, said first and second block members, and said keel together with said first and second block members. compressed against said exterior and interior surfaces of said keel to prevent stressing thereof, a bracket on which said engine and propeller are supported, and resilient shock absorbing fasteners affixing said bracket between the forwardly extending ends of said mounting plates for dampening vibration of said engine, whereby said cantilever mounting frame substantially isolates engine vibrations from said keel.

4,548,372

LAWN AND LEAF BAG HOLDER

Robert S. Lutzker, 21 Lee Avenue, East Williston, N.Y. 11596

Filed Aug. 1, 1983, Ser. No. 519,319
Int. Cl.⁴ D65B *67/04*
U.S. Cl. 248—99 **7 Claims**



1. A lawn bag holder comprising:

a plurality of elongated rods, the plurality of rods comprising at least three rods, the rods comprising a cylindrical polymeric tubing and being substantially straight end to end;

a means for fastening the rods together end to end in a substantially straight sided geometrical configuration, he fastening means comprising flexible tubing;

a plurality of clips attached to the rods and overlying a substantial portion of the length of the rods in order to secure a lawn bag thereto, the clips being shorter in length than the rods to which they are attached, the clips being elongated partially cylindrical shell sections composed of a resilient polymeric material, the partially cylindrical shell section having an inner diameter fit to closely overlay the outer diameter of the rod, and the inner portion of the shell portion overlaying more than 180 degrees of the surface of the rod so that the edges of the shell portion are spaced a distance less than the outer diameter of the rod when the clip is in place, lateral flanges extending along and substantially radially outward from the edges of the partially cylindrical shell section to facilitate removal of the clips from the rods, each rod having an end portion extending beyond the corresponding end of the clip to permit the rod to be grasped in one hand and the clip flanges in the other hand thereby gaining leverage to separate the clip from the rod.

4,548,373

MEDICAL EQUIPMENT SUPPORTING DEVICE

Seiichi Komura, Osaka, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 589,273
Claims priority, application Japan, Mar. 22, 1983, 58-39583[U]; Feb. 20, 1984, 59-23355[U]
Int. Cl.⁴ B61L *13/00*
U.S. Cl. 248—122 **4 Claims**

1. A medical equipment supporting device comprising:

a support pole having a shaft;

an arm rotatably supported by said shaft at one end thereof, said arm supporting medical equipment at the other end thereof;

at least one brake disc fitted on said shaft;

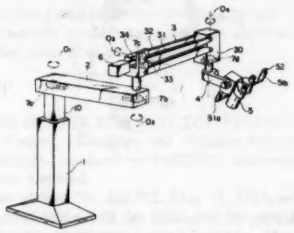
brake shoes fitted on the inside of said arm for holding said at least one brake disc therebetween in pressed manner;

leveraged brake shoe-pressing means for ordinarily exerting a holding force on one of said brake shoes; and

release means for releasing said brake shoes from the holding force of said brake shoe-pressing means in response to an instruction signal from instruction means to be operated by an operator;

the holding force of said brake shoe-pressing means being selected such that it fixedly supports said arm relative to said support pole when said arm is at rest,

whereby when said arm is moved relative to said support pole without operating said instruction means, said brake shoes can be moved on said at least one brake disc against the holding force of said brake shoe-pressing means to enable said arm to be finely adjusted in position, and when said arm



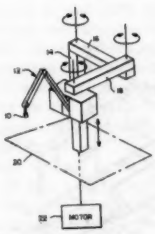
is moved upon operating said instruction means, said brake shoes are released from the holding force of said brake shoe-pressing means, but are maintained in sufficient friction contact with said at least one brake disc to prevent spontaneous rotation of said arm relative to said support pole shaft due to the weight of the arm itself and its distribution about the shaft.

4,548,374

ULTRASONIC SCANNING APPARATUS AND POSITIONING SYSTEM

Craig R. Thompson, Rancho Cordova, and Ted F. Naumann, Jr., Shingle Springs, both of Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 7, 1981, Ser. No. 290,837
Int. Cl.⁴ F16L *3/00;* **E04G** *3/00*
U.S. Cl. 248—123.1 **3 Claims**



1. Positioning apparatus for vertically moving a scanning assembly comprising a verticl support, a first arm pivotally mounted to said support and to said assembly, a second arm pivotally attached to said vertical support and to said assembly, said first and second arms being parallel,

a counterweight and coupling means for coupling said counterweight to the vertical support, said coupling means comprising third and fourth arms each pivotally attached to said vertical support and to said counterweight, said third and fourth arms being parallel, and

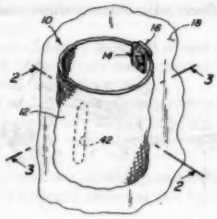
a fifth arm pivotally attached to said first arm and to said counterweight.

4,548,375

HOLDER FOR ALL ITEMS AND THE LIKE

Ernest Moss, 157-16 13th Ave., Beechhurst, N.Y. 11357

Filed Apr. 15, 1983, Ser. No. 485,441
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—205.2 **7 Claims**



1. A holder for all items and the like which comprises:

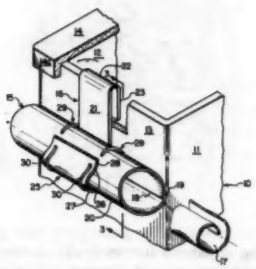
a flexible expandable sleeve open at least one end, made of durable material to hold the items within it; at least one elongated strip of one part of loop pile fastener secured along the entire length of the exterior of the sleeve, a portion of said strip bending over the edge of said sleeve and extending part way along the interior surface of said sleeve, a tab of the mating part of the loop pile fastener for securing said sleeve in various directional orientation, onto a support surface; an inverted "U" shaped strip of the mating part of the loop pile fastener having a pair of leg portions for matingly coupling onto said elongated strip of said one part loop pile fstener so as to straddle the bent over portion of said elongated strip and project upwardly therefrom to form a loop, and a securing member for passing through said loop, whereby said sleeve can be supported at any desired height by said mating loop pile coupling and can depend from a support by said loop pile and securing member.

4,548,376

SUPPORT RECEPTACLE FOR A NEWSPAPER, MAGAZINE OR THE LIKE

James A. DeGore, 4308 Frank St., Pittsburgh, Pa. 15217

Filed Sep. 30, 1982, Ser. No. 428,959
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—205.4 **2 Claims**



1. A holder carried by a toilet assembly to support an article such as folded or rolled newspaper or magazine or a book or the like, said holder comprising

an elongated carrier receptacle having a generally cylindrical shape defining a support area with an access opening at one end thereof to permit loading and unloading of an article in said receptacle, and

a hanger means for said receptacle, said hanger means having an inverted "U" shaped end section to partly encircle an upwardly facing rim section of a toilet assembly with a shank portion extending externally thereof into supporting engagement with said receptacle,

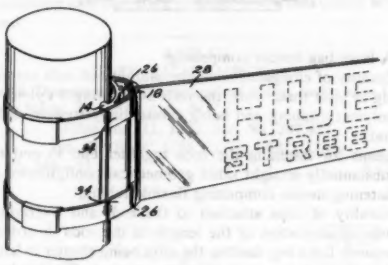
a wall section extending externally of the support area defined by said receptacle at a site generally opposite said hanger means to form a yieldable external pocket for receiving an article passed between the wall section and said receptacle.

4,548,377

SIGN MOUNTING SYSTEM

Georges Huel, 65 Sherbrooke St. East, Montreal, Quebec, Canada H2X 1C4

Filed Mar. 14, 1984, Ser. No. 589,467
Claims priority, application Canada, Apr. 26, 1983, 426736
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—219.1 **7 Claims**



1. A bracket for supporting a sign on a post, the bracket comprising:

an elongated body having a generally concavely curved base for engaging the post, two spaced side walls each extending from an opposite side of said base towards one another and having opposed, free edges spaced apart to define a slot means for receiving a portion of a sign, said free edges each having means for receiving a strap such that the strap will extend about the post over said side walls and across a portion of said slot means to retain a sign in place with one end thereof in said slot means when said bracket and sign are mounted on a post by the strap.

4,548,378

DISPLAY AND SHELF SUPPORT BRACKET AND THE LIKE

Anthony C. Worrallo, Private Bag, Onehunga, Auckland 6, New Zealand

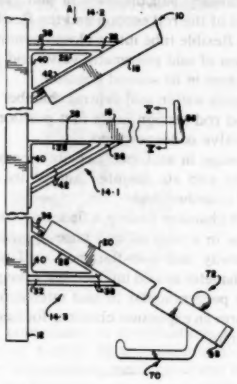
Filed Mar. 25, 1982, Ser. No. 361,988
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—558 **16 Claims**

1. A structure, comprising;

a first element having two spaced apart portions defining a mouth therebetween with a first normal width between said portions;

first and second arms, each of said arms having opposite first and second faces, each of said first faces having a first groove adjacent a first end thereof to receive said portions when said arms are located in said mouth and when said second faces are juxtaposed, said first grooves having bottom surfaces spaced by a distance greater than said first width such that said arms force said portions apart when said second faces are juxtaposed, said first end of each of said arms being bounded by a rolling surface merging with said second face thereof, said rolling surfaces enabling said arms to roll on each other between a locking position in which said second faces are juxtaposed and a release position in which said rolling surfaces are engaged and said arms diverge from said first ends, said arms being inserted into and

removed from said mouth in said release position, each of said first faces also having a second groove; and



a second element including formations slideable into said second grooves to maintain said arms in said locking position.

4,548,379

COMPACT SIGN AND STAND

James R. Seely, Rochester, and Cecil E. Ursprung, Ann Arbor, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Nov. 17, 1982, Ser. No. 442,418
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—624 **20 Claims**

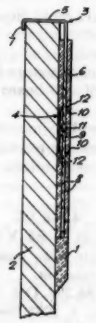
1. A sign and sign stand assembly, wherein said sign and stand include a base, a longitudinally-extending generally upright member, connecting means for connecting said upright member to said base, and attaching means for removably securing said sign to said upright member, said base including a plurality of ground-engaging legs thereon, each of said legs being selectively retractable into a shortened configuration or extendable into an elongated configuration, each of said legs further being pivotal between a first position generally parallel to said upright member and a second position generally perpendicular to said upright member, said base further including resilient biasing means for normally biasingly supporting said upright member in a generally vertical position, said resilient biasing means being resiliently yieldable to allow said upright member to pivotally deflect in a generally downward direction in response to first predetermined forces exerted on said sign, said upright member and said base having a combined overall length approximately equal to the length of said legs when in said shortened configuration, said sign including a foldable sign panel and at least one cross-brace for supporting said foldable sign panel in a generally planar configuration, said attaching means including channel means on said upright member for slidably receiving a first portion of said cross-brace removably inserted therein in order to removably secure said cross-brace thereto in a generally longitudinally-extending disposition thereby displaying said sign on said sign stand, a substantial portion of said longitudinally-extending cross-brace being free of said channel means and substantially unsupported thereby when slidably and removably inserted therein in order to allow said sign panel and at least said substantially unsupported portion of said cross-brace to pivotally swing laterally relative to the axis of said longitudinally-extending upright member in response to second predetermined forces exerted generally parallel to the plane of said sign panel.

4,548,380

HOLDING DEVICE FOR HOT TOP LINING SLABS

Kenneth C. Cooper, Hamilton, and William Pollard, Guelph, both of Canada, assignors to FOSECO International Ltd., Birmingham, England

Continuation of Ser. No. 262,707, May 11, 1981, abandoned.
This application Feb. 24, 1983, Ser. No. 469,309
Claims priority, application United Kingdom, May 17, 1980, 8016383
Int. Cl.⁴ B22D *7/10*
U.S. Cl. 249—106 **5 Claims**



1. An ingot mould having in its head a hot top lining provided by a plurality of hot top lining slabs hung from the top of the mould, wherein each of said slabs includes at least one holding means for hanging said slab from the top of the mould, said at least one holding means comprising:

a generally L-shaped strap having shorter and longer arms, the shorter arm of which is engaged with the top of the mould for hanging the slab, and the longer arm of which includes means defining a plurality of longitudinally spaced-apart notches; and

strap-receiving means secured to the slab and defining an elongated cavity in which said longer arm is received to be longitudinally movable between upper and lower positions as well as rotatable between latched and unlatched positions, said strap-receiving means including, (a) a substantially planar side wall disposed substantially parallel to said elongated cavity and having a resilient latching tongue means inwardly disposed in a direction towards said cavity, one end of said tongue means fixed to said side wall and the other end being engaged with a predetermined one of said notches when said longer arm is rotated to said latched position, said tongue means being downwardly inclined between said one and other ends in the direction of longitudinal movement of said longer arm when said longer arm is moved from said upper position to said lower position, and (b) a pair of spaced apart end walls each being disposed substantially transverse to said elongated cavity and defining an aperture in alignment

with said elongated cavity thereby permitting said longer arm to pass therethrough,

said strap-receiving means permitting said longer arm to freely move longitudinally within said cavity between said upper and lower positions when rotated to said unlatched position and for permitting said other end of said tongue means to engage a predetermined one of said notches when said longer arm is rotated to said latched position, and

said tongue means for resiliently biasing said longer arm against upward movement in said engaged position to restrain said longer arm in said cavity and to hold the hot top lining slab in the head of the ingot mould.

4,548,381

CASTABLE RECEIVER

Curtis P. Mabie, Jr., Thurmont; Robert L. Busby, Gaithersburg, and James A. Cliber, Wheaton, all of Md., assignors to Solarex Corporation, Rockville, Md.

Filed Sep. 5, 1984, Ser. No. 647,432

Int. Cl.[4] B29C *1/00*; B28B *7/36*

U.S. Cl. 249—114 R **15 Claims**

1. A receiver for casting molten material, wherein said receiver is formed by the steps comprising:

(a) forming a mixture comprising particulate ceramic powders and a binder;

(b) adding said mixture to a mold disposed to form a board-like member;

(c) hardening said mixture;

(d) removing said hardened mixture from said mold;

(e) heating the surface of said board-like members to reduce their permeability;

(f) cementing said board-like members together to form a receiver with a temperature resistant cement; and

(g) coating said receiver with release agents.

4,548,382

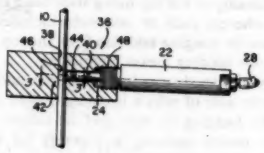
PINCH TUBE VALVE

Billy J. Otting, LaFayette, Ga., assignor to Otting Machine Company, Inc., LaFayette, Ga.

Continuation of Ser. No. 86,392, Oct. 18, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,954

Int. Cl.[4] F16L *55/14*

U.S. Cl. 251—5 **6 Claims**



1. A pinch tube valve assembly adapted to receive an elongated flexible tube for selective control of liquid dye flow through the tube, said valve assembly comprising:

a valve block having a bore circular in cross section extending through said block for receiving the flexible tube, a passageway in said block, said passageway also being circular in cross section and intersecting with said bore at a right angle thereto, said passageway having a diameter larger than that of said bore, the intersection of said bore and said passageway defining a pinch chamber;

an electrically operated pneumatic valve;

an intermediate block portion member supported at one end to said valve block and supporting at its other end said pneumatic valve, an air chamber formed between said other end of said intermediate block portion and the pneumatic valve; said intermediate block portion including a central chamber, piston means within said chamber having a rod section at one end and being selectively reciprocal in said passageway between a first position and a second position,

a freely floating ball disposed in said passageway between one end of the rod section and the flexible tube for pinching the flexible tube into a closed condition in response to actuation of said pneumatic valve and positioning of said rod section in its second position;

spring means within said central chamber arranged to maintain said rod section in its first position while said pneumatic valve is deenergized;

an air passage in said intermediate member opening at one end into said air chamber and at its other end to said central chamber; and

said pinch chamber having a flattened wall portion circular in shape in a wall of said bore opposite the intersecting passageway and said flattened wall portion having the same diameter as said intersecting passageway and lying in a plane perpendicular to said intersecting passageway so as to form an expansion chamber for said tube upon pinching thereof.

4,548,383

ELECTRICALLY CONTROLLED PRESSURE REDUCING VALVE

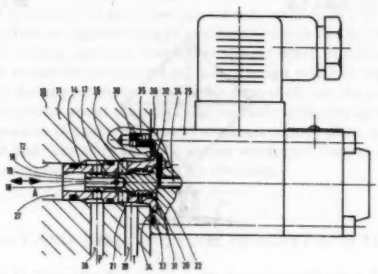
Hans Wölfges, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,741

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307554

Int. Cl.[4] F16K *31/02*

U.S. Cl. 251—129 **5 Claims**



1. An electrically controlled pressure-reducing valve comprising a valve housing, a valve bore in said housing, a valve sleeve in said bore, a piston slidably arranged in a bore of said valve sleeve, and a proportional magnet having a housing connected to said valve housing by a plurality of screws with said magnet housing and said valve housing having abutting faces, the proportional magnet including an armature pin contacting said piston for moving said piston, said proportional magnet controlling the desired output pressure through cooperation of said piston with said valve sleeve, characterized in said valve sleeve having an annular flange received with play within a circular recess formed at least in said abutting face of said magnet housing, said annular flange being loosely fixed within said circular recess prior to assembly of said valve housing and said magnet housing by flared portions means of an edge of the housing defining said recess for movement of said valve sleeve relative to said circular recess for locating of said valve sleeve within said valve bore to compensate for irregularities in the alignment of said abutting faces upon assembly.

4,548,384

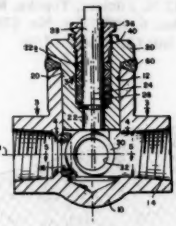
TOP ENTRY METAL-SEATED BALL VALVE

Bruce L. Harding, Holden, Mass., assignor to Smith Valve Corporation, Westboro, Mass.

Filed Dec. 15, 1983, Ser. No. 561,887

Int. Cl.⁴ F16K *5/06*

U.S. Cl. 251—163 **6 Claims**



1. A ball valve comprising in combination: a valve body having a cylindrical bonnet bore communicating with a through fluid bore; an unyielding metal valve seat in said valve body surrounding the fluid bore axis; an externally cylindrical bonnet rotatably received in said bonnet bore, said bonnet having a stem bore extending therethrough; a stem rotatably received in said stem bore; a ball in said fluid bore, said ball having a through passageway and being fixed to said stem for rotation therewith, the axis of said stem bore being offset with respect to the rotational axis of said bonnet and the center of said ball being offset with respect to the rotational axis of said stem, whereupon by selected rotation of said bonnet and said stem during initial assembly of said valve, said ball may be located in a closed position against said valve seat; and means for fixing said bonnet in said bonnet bore, whereupon said ball subsequently may be operated between said closed position and an open position aligning said through passageway with said fluid bore by rotating said stem in relation to the thus fixed bonnet.

4,548,385

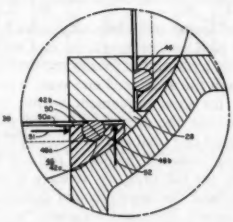
FLEXIBLE SEAL FOR ROTOR VALVES

David J. Barbuto, Lynnfield, Mass., assignor to Quality Controls, Inc., Tilton, N.H.

Continuation of Ser. No. 104,889, Dec. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 59,219, Jul. 20, 1979, abandoned, which is a continuation of Ser. No. 892,771, Mar. 29, 1978, abandoned. This application Apr. 28, 1982, Ser. No. 372,815

Int. Cl.⁴ F16K *25/00*

U.S. Cl. 251—175 **2 Claims**



1. In a rotor valve having a body with at least one fluid inlet port and at least one fluid outlet port, a cylindrical rotor chamber formed in the body and in fluid communication with the ports, and a rotor having a cylindrical outer surface disposed in said rotor chamber having an interior bore, said rotor being rotatable about its longitudinal axis in said chamber to control a fluid flow through said valve among said ports by way of said interior bore, wherein the improvement comprises means for establishing a fluid seal between said rotor and said rotor chamber, comprising

a plurality of channels formed on the outer surface of said rotor, each of said channels extending parallel to said axis of rotation and having a rear surface facing said rotor chamber and a pair of side surfaces,

a plurality of sealing members formed of a generally rigid yet deformable material that exhibits a low coefficient of sliding friction comprising tetrafluoroethylene, each of said sealing members being seated in an associated one of said channels, said members each having a curved outer surface adjacent said rotor chamber having the configuration of a portion of a cylinder, said sealing member outer surface mating with the surface of said rotor chamber in a fluid-sealing relationship over the surface area of said outer surface, a rear surface opposite said curved surface which is closely spaced from said rear surface of said channel and an opening that extends through said sealing member from said outer curved surface to said rear surface, said opening being positioned to align with said ports to allow said fluid flow through said port and said opening to said interior bore,

a groove formed in said rear surface of said sealing member, said groove being concentric about said opening, circumscribing said opening, and spaced laterally from said opening by a uniform distance to define a narrow, circular wall,

a plurality of resilient O-ring members, each of said resilient members being snugly engaged within an associated one of said grooves with a portion of said resilient member not held in said groove protruding from said rear surface at least the distance of said spacing to develop a radial force that flexibly urges the curved surface of said insert into said sliding, fluid-tight engagement with said chamber and to establish a fluid seal between the associated sealing member and said rotor,

wherein said wall has substantially uniform dimensions and is sufficiently narrow that the wall will deform laterally outward in response to fluid pressure in the valve thereby compressing said resilient member engaged in said groove which in turn generates an enhanced degree of said radial force and an enhancement of said fluid seal between the associated sealing member and said rotor,

said resilient members providing the principal radial sealing force urging said sealing members into said fluid-sealing relationship with the opposite portion of said rotor chamber.

4,548,386

GATE VALVE

Manfred Gladisch, Herne, and Erwin Winklmann, Oberhausen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,633

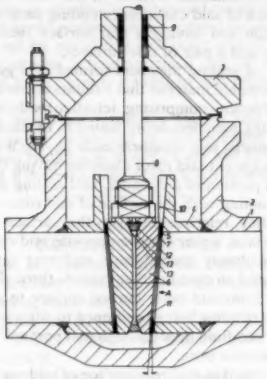
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320809

Int. Cl.⁴ F16K *3/12*

U.S. Cl. 251—327 **5 Claims**

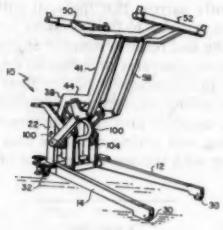
1. A valve comprising: a shaft; two wedge-shaped disks suspended on said shaft; said disks having annular sealing surfaces on their outside; a compression member of supporting said disks against each other on the inside, said disks forming an angle of 2°–10° with respect to the longitudinal axis of the shaft; said compression member being positioned at the level of the sealing surfaces on said disks and comprising a ring-shaped member with spherical faces that rest against corresponding mating surfaces, said spherical faces forming an angle of 15°–50° with the longitudinal axis of the shaft; said ring-shaped member being located between said disks, spaced from and disconnected from said shaft for preventing direct loading by said shaft, said disks being slidable relative to one another along said spherical faces of said ring-shaped member and

along corresponding mating surfaces of said disks, said disks lying against seating rings of a disk housing corresponding to



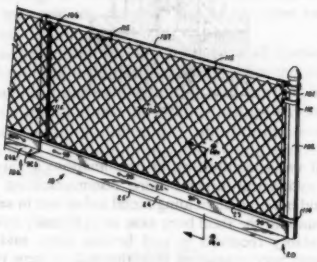
properties of a mathematically precise wedge so that opening force is less than closing force of the valve.

4,548,387
MOBILE HOIST
Pasqualino Saccoccia, Montesilvano Pescara, Italy, assignor to Euro California, Inc., San Diego, Calif.
Filed Apr. 27, 1984, Ser. No. 604,843
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—10 B **8 Claims**



1. A mobile lift for automobile vehicles comprising:
a horizontal base support frame comprising vertical tower means and a pair of spaced apart leg members connected to the base of said tower means and extending outward in a generally common direction,
an elongated generally Z-shaped boom having an elongated inner section including an inner end and an elongated outer section including an outer end offset from and parallel to said inner section and an offset member connecting said inner section and said outer section together and pivotally mounted at said inner end to said tower means,
a support platform pivotally mounted on the outer end of said boom,
leveling linkage means pivotally connected at one end of said tower means and at the other end to said support platform and comprising an arm pivotally connected to said boom intermediate the ends thereof,
an outer link connected to said support platform and to said arm, and an inner link connected at one end to said tower and at the other end to said arm for maintaining said support platform in a level condition in all positions of said boom from a lowered position to a maximum lift position, and
lift motor means for controllably moving said boom between said lowered position and said maximum lift position.

4,548,388
FENCE PROTECTOR
Larry L. Cobler, 1812 N. Filmore, Topeka, Kans. 66608
Filed Dec. 6, 1984, Ser. No. 678,637
Int. Cl.[4] E04H *17/06*
U.S. Cl. 256—32 **7 Claims**

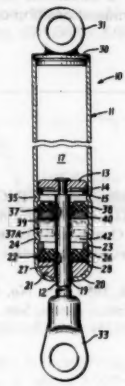


6. In combination with a fence extending between longitudinally spaced-apart posts, a fence guard comprising:
first and second panel members each having a pair of first legs positioned along opposed sides at the bottom of said fence in a vertical position to form a fence-receiving channel with the fence bottom therein;
a compressible material for insertion between said fence and a first leg of one of said panel members;
means for drawing said respective first legs one to the other to compress said material therebetween,
said compression causing said material to contact the other first leg of said other panel whereby to fill said channel, said material restricting the entry of growth enhancing elements in said channel whereby to restrict said growth of vegetation therein.

4,548,389
REDUNDANT HIGH-PRESSURE SEAL FOR FLUID SPRING
Lawther O. Smith, Doylestown; Timothy L. Howard, Ambler, and Franz A. Kautz, Southampton, all of Pa., assignors to Fichtel & Sachs Industries, Inc., Colmar, Pa.
Continuation-in-part of Ser. No. 470,788, Mar. 1, 1983, abandoned. This application Sep. 16, 1983, Ser. No. 533,202
Int. Cl.[4] F16F *3/00, 5/00, 13/00*
U.S. Cl. 267—64.11 **9 Claims**

1. In a pneumatic spring including a cylinder having a side wall, a closed end wall and an apertured end wall defining a sealed cavity therein, a piston rod axially movable into and out of the cavity through the apertured end wall, a piston carried by the piston rod for axial movement within the cavity, a pressurized fluid within the cavity, and fixed sealing means adjacent the apertured end wall and enveloping the piston rod for establishing a seal between the piston rod and the cylinder against substantially the full pressure, relative to atmospheric, of said pressurized fluid, the improvement comprising:
floating sealing means, disposed between the fixed sealing means and the piston and enveloping the piston rod, for establishing a seal between the piston rod and the cylinder capable of sealing against substantially the full pressure, relative to atmospheric, of said pressurized fluid, said floating sealing means being axially movable relative to said piston rod and said cylinder and defining with said fixed sealing means a sealed chamber of variable volume surrounding said piston rod;

a liquid filling said sealed chamber, the pressure exerted on said floating sealing means by said pressurized fluid being transmitted to said liquid so that the pressure differential across said floating sealing means is relatively small so long as said sealed chamber remains filled with said liquid; and



in the event of leakage of said liquid past said fixed sealing means, said floating sealing means being axially movable outwardly towards said fixed sealing means to contain said liquid in surrounding relationship to said piston rod and, in the event of complete loss of liquid past said fixed sealing means, said floating sealing means functioning as a back-up seal against the loss of said pressurized fluid from said cavity.

4,548,390

SPRING UNIT

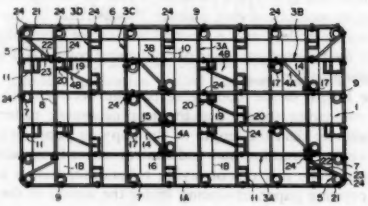
Noboru Sasaki, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed May 1, 1984, Ser. No. 605,698

Claims priority, application Japan, May 10, 1983, 58-81463

Int. Cl.⁴ F16F *3/04*

U.S. Cl. 267—91 **7 Claims**



1. A spring unit comprising:

a rectangular base plate;

a plurality of first main springs each having one straight rod portion and two coil portions which are connected at one end to the ends of the straight portion;

a plurality of second main springs each having one straight rod portion and two torsion bar spring portions which are connected at one end to the ends of the straight rod portion, said first and second main springs being parallel to each other and alternately arranged on said rectangular base plate;

a plurality of third main springs each having one straight rod portion and two coil portions which are connected at one end to the ends of the straight rod portion;

a plurality of fourth main springs each having a straight rod portion and two torsion bar spring portions which are connected at one end to the ends of the straight rod portion, said third and fourth main springs being parallel to each other and alternately arranged on said rectangular base plate, with the straight rod portions of said third and fourth main springs arranged at right angles to the straight rod portions of the first and second main springs;

first fastening means fastening the other end of each coil portion and the other end of each torsion bar spring portion to said rectangular base plate;

a rectangular frame;

first coupling means coupling said one end of each coil portion and said one end of each torsion bar spring portion to said rectangular frame;

a plurality of first intermediate support springs arranged on said rectangular base plate;

second coupling means coupling one end of each first intermediate support spring to at least one of said first, second, third or fourth main spring straight rod portion; and

second fastening means fastening said other end of each first intermediate support spring to said rectangular base plate.

4,548,391

FIBER CRAFT HOLDER

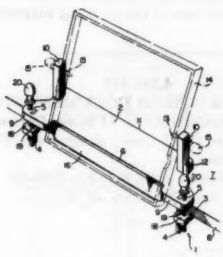
Gillian Loban, 115 Maple Court Crescent SE., Calgary, Alberta, Canada (T2J 1V9)

Continuation-in-part of Ser. No. 308,571, Oct. 5, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,053

Claims priority, application Canada, Dec. 17, 1980, 366935

Int. Cl.⁴ B25B *1/22*

U.S. Cl. 269—47 **2 Claims**



1. A work holder for supporting a work holding frame for use by handicapped persons for mounting on the edge of a table top or the like comprising a top plate member for mounting above the table top and including a pair of laterally spaced integral first arm portions projecting from said top plate member beyond the edge of the table top; a pair of bottom plate members for mounting below the table top and each including integral second arm portions extending beyond the edge of the table top and beneath said first arm portions; guide means extending between the superjacent of said first and second arm portions and slidably interconnecting said first and second arm portions for maintaining said top and bottom plate members in substantially parallel relationship to each other on opposite sides of the table top, said guide means including a bar connected to each of said first arm portions and extending downwardly therefrom; each said second arm portions having an opening for receiving said bar, whereby the bottom plate members are vertically slidable with respect to said top plate member; screw means including elongated screws extending through said first arm portions and threadedly engaging said second arm portions for moving said top and bottom plate members toward and away from each other so as to clamp the table top between said top and bottom plate members in position on the table top; and support means upstanding from said

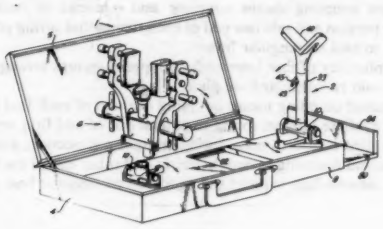
top plate member for supporting a work holding frame on said top plate member.

4,548,392

PORTABLE GUN HOLDER CASE

Arthur R. Rickling, 5521 Mossvale Cir., Huntington Beach, Calif. 92649

Filed May 16, 1983, Ser. No. 494,784
Int. Cl.⁴ B23Q *3/18*
U.S. Cl. 269—156 **14 Claims**



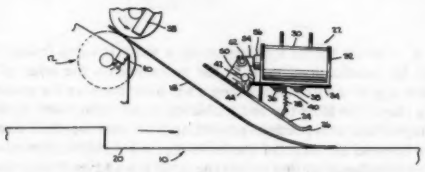
1. A portable gun holder comprising:
a carrying case;
a front-end suppordt member;
a rear-end support and clamping member said member including a pair of individually adjustable clamping arms; and
two pivoting support base assemblies mounted within the carrying case wherein the front-end support member and the rear-end support and clamping member are each separately attached to one of the pivoting support base assemblies.

4,548,393

INSERTER FEEDER DOCUMENT STOP

Robert Irvine, Riverside; John G. O'Brien, Darien, and Harry E. Luperti, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 9, 1984, Ser. No. 569,415
Int. Cl.⁴ B65H *43/00*
U.S. Cl. 270—59 **5 Claims**



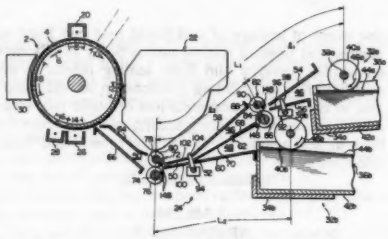
1. In an inserting machine having a plurality of feeders arranged horizontally with respect to each other for feeding documents seriatim at an inclined angle to a single, horizontal, stepped transport deck therebelow, each of said feeders being angled with respect to said deck and having a pair of feeder exit rollers located above said transport deck, a stopping mechanism associated with each of said feeders for stopping said documents at a predetermined position with respect to a previously collated package situated on an upstream and elevated portion of said deck, said stopping mechanism comprising:
a pivotable paddle located above said transport deck and downstream of said feeder exit rollers for stopping said documents in the course of their passing below said paddle, said paddle being substantially parallel to the inclined direction of feed;
means for biasing the lower end of said paddle away from said transport deck therebelow to permit a collated package to pass therebelow without contacting said pivotable paddle; and
means for pivoting the lower end of said paddle downward adjacent said transport deck therebelow for a short period of time at an appropriate moment in order to stop the forward motion of a document exiting the feeder exit rollers at a predetermined position on the transport deck.

4,548,394

COPYING PAPER CONVEYING DEVICE IN ELECTROSTATIC COPYING APPARATUS

Shigeo Koyama, Higashi Osaka, and Hiromi Sakata, Neyagawa, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 9, 1983, Ser. No. 530,846
Claims priority, application Japan, Sep. 14, 1982, 57-160658
Int. Cl.⁴ B65H *5/06, 29/20, 3/44*
U.S. Cl. 271—9 **6 Claims**



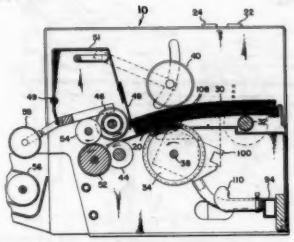
1. An electrostatic copying apparatus, comprising a copying paper conveying device having a paper feed means for feeding a sheet of copying paper, a guide means defining a conveying passage for copying paper fed from said paper feed means, a pair of conveying rollers disposed in said conveying passage for advancing the copying paper from the paper feed means through said conveying passage, a pair of timing rollers disposed in said conveying passage downstream of the pair of conveying rollers and a control means for controlling said paper feed means, said pair of conveying rollers and said pair of timing rollers,
the length of the conveying passage between the pair of conveying rollers and the pair of timing rollers being shorter than the length of the copying paper in the conveying direction, and said control means being adapted to make the pair of conveying rollers inoperative after the copying paper advancing under the action of the pair of conveying rollers in the operative state is bent between the pair of conveying rollers and the pair of timing rollers by the abutting of its leading edge against the pair of timing rollers in the inoperative state, and thereafter to make the pair of timing rollers operative at a predetermined time thereby starting the advancing of the copying paper by the pair of timing rollers, said control means also making the pair of conveying rollers operative in required relation to said predetermined time of making the pair of timing rollers operative, so that the copying paper is maintained bent between the pair of conveying rollers and the pair of timing rollers after advancing of the copying paper is started by setting the pair of timing rollers in operation and at least before the trailing edge of the copying paper leaves the pair of conveying rollers.

4,548,395

MICROFICHE FEEDER

Donald L. Snellman, 2807 W. Galer St., Seattle, Wash. 98199; Bernard A. Pearson, and John W. Jacobs, both of King County, Wash., assignors to Donald L. Snellman, Seattle, Wash.

Filed Feb. 4, 1983, Ser. No. 463,982
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—11 **20 Claims**



4. A microfiche feeder for conveying single sheets of microfiche at high speeds up to about 8,000 sheets per hour from a stack to a collator, a sorter, or other processing apparatus, comprising:

(a) a receiver for receiving a stack of microfiche;

(b) an incrementally revolving, vacuum-powered drive wheel to contact the lowest sheet of microfiche and to convey that lowest sheet forwardly when the drive wheel revolves;

(c) a vacuum control means to supply suction at the drive wheel immediately before and during a first incremental revolution, to cut the suction to allow the sheet to be drawn to the other processing apparatus, and to supply the suction again to hold the remaining sheets back as a single sheet is withdrawn; and

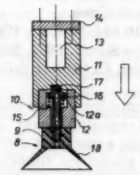
(d) means for further processing the single microfiche sheet, including means to receive the sheet incremented forwardly by the drive wheel.

4,548,396

OBJECT-HOLDING DEVICE OF SUCKER CUP TYPE AND SHEET DISPENSING APPARATUS INCORPORATING SUCH DEVICE

Petrus R. Nelen, Essen, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 25, 1983, Ser. No. 498,158
Claims priority, application United Kingdom, May 26, 1982, 8215349
Int. Cl.[4] B65G *59/04*; B65H *3/08, 3/42*
U.S. Cl. 271—90 **7 Claims**



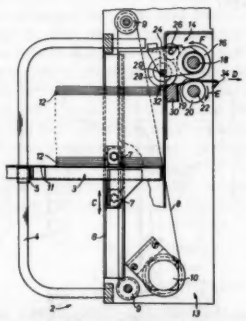
1. Sheet dispensing apparatus comprising at least one sheet holding device of the flexible sucker-cup type comprising a cup component including a flexible sucker cup which when pressed against an object to be held becomes deformed with consequential expulsion of air from within the cup and gripping of the object by the cup, and a vent passage communicating between the interior of the cup and the exterior atmosphere, a supporting body upon which said cup component is mounted for projection and retraction relative to said body, biasing means urging said cup component into its retracted position on said supporting body, and a sealing member carried by said body for sealing engagement with the exterior opening of said vent passage when said cup component is in its retracted position, whereby relative displacement of said component and body from said retracted position breaks the vent passage seal to admit air of the cup interior to release said object; a carriage carrying such supporting body for bodily displacement repetitively through an operating cycle for gripping at least one sheet at a pick-up station, advancing such sheet holding device with the attached sheet from that station to another station at which the sheet is released, and subsequently returning to said pick-up station for gripping another sheet; and sheet releasing means operative at the sheet release station of said cycle to cause projected movement of the cup component from its retracted position relative to said supporting body against the action of said biasing means thereby to open said vent passage to atmospheric air and effect release of the gripped sheet.

4,548,397

SINGLE-SHEET SEPARATING APPARATUS, PARTICULARLY FOR USE WITH OFFICE MACHINES

Kurt Rünzi, Küsnachtstrasse 59, CH-8126 Zumikon, Switzerland

Filed Dec. 12, 1983, Ser. No. 559,901
Claims priority, application Switzerland, Dec. 16, 1982, 7346/82
Int. Cl.[4] B65H *3/52*
U.S. Cl. 271—121 **16 Claims**



1. Single-sheet separating apparatus to separate an outermost single sheet from a stack (**12**) and feed said single sheet in predetermined feeding direction (D) having

a first roller (**20**) and a second roller (**16**), said rollers being positioned to define between the circumferences thereof a feeding nip (**19**), said apparatus further comprising, in accordance with the invention,

a first shaft (**22**);

a one-way clutch (**21**) interposed between the shaft and the first roller (**20**) and permitting rotation of the first roller only in the feeding direction (D) while blocking rotation in reverse direction (G) of said first roller (**20**);

and means (**18, 50, 52**) coupled to said first shaft for imparting to said first shaft a rocking movement about a limited rotary angle to rotate said first roller (**20**) in said reverse direction (G) for said limited rotary angle to engage a possibly present second sheet, adhering to said single sheet, and prevent feeding of said second sheet through said feeding nip; a third roller (**28**) located immediately above the outermost sheet of the stack and engageable therewith;

a separating element (**30**) located adjacent the edges of the

sheets of the stack which form the forward or leading edges in said predetermined feeding direction (D) and positioned in surface engagement with said third roller;

one of said first or second rollers (**20, 16**) being driven;

and a rotation transfer roller (**26**) between said one of said first or second rollers which is driven and said third roller to transfer rotary movement thereto and provide for feeding of a sheet in said predetermined feeding direction (D) between said third roller and said separating element (**30**), said third roller being located in advance—in feeding direction (D)—of the feeding nip (**19**) defined between the circumferences of the first roller and the second roller, said third roller and separating element (**30**) forming a first separating stage, and said first roller and second roller in combination with the means (**18, 50, 52**) for imparting to said first shaft a rocking movement forming a second sheet separating stage, downstream, in said feeding direction (D) from said first separating stage.

4,548,398

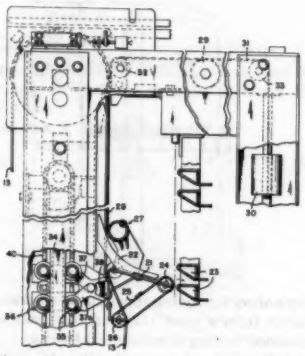
COLLATOR

Donald L. Snellman, 2807 W. Galer St., Seattle, Wash. 98199, and Bernard A. Pearson, Bothell, Wash., assignors to Donald L. Snellman, Seattle, Wash.

Continuation of Ser. No. 209,045, Nov. 21, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,417

Int. Cl.⁴ B65H *29/14, 29/60*

U.S. Cl. 271—197 **10 Claims**



1. A vacuum sheet-transport system for transporting sheets with less noise and reduced power requirements, comprising:

an elongated plenum longitudinally elongated in the direction of sheet travel, the plenum having a planar surface with at least one longitudinally extending series of openings extending along the longitudinal dimension of the plenum, the openings being flush with the plenum surface and being spaced apart so that the distance between successive openings in the series gradually and systematically increases from an initial spacing to a spacing twice as wide as the initial, and

a sheet conveyor belt positioned for travel over the planar surface in the direction of sheet travel and aligned with the openings, the belt having a plurality of regularly spaced openings of considerably greater diameter than the openings in the plenum which pass over the openings in the plenum.

4,548,399

APPARATUS FOR ALIGNING SHEETS IN A STACK

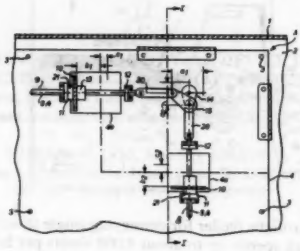
Alfred Heider, Munich; Erich Schlick, Lohof, and Günther Schnall, Eching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,594

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233811

Int. Cl.⁴ B65H *31/38*

U.S. Cl. 271—221 **11 Claims**



1. An apparatus for aligning and squaring a stack of sheets, the apparatus comprising:

a support plate having a generally horizontal and flat support surface adapted to support the stack of sheets;

a guide projecting upward from the support surface and having an abutment face directed in a predetermined direction generally parallel thereto;

a generally horizontal rod vertically spaced from the surface and stack and extending in the direction;

a pusher element carried on the rod and slidable thereon in the direction, friction alone linking the element and rod together in the direction, the pusher element being engageable with a sheet on the surface;

a stop facing opposite to the direction and engageable with the element; and

drive means for reciprocating the rod in the direction through a predetermined stroke toward and away from the guide, whereby on displacement toward the guide the element engages and pushes a sheet opposite the direction until the sheet engages thereagainst, at which time the element slides on the rod and on opposite displacement the element engages the stop and is displaced relative to the rod in the direction.

4,548,400

INSERTER GAUGING SYSTEM

Dean H. Foster, Stratford; Robert E. Mersereau, Westport, and Harold Silverman, Norwalk, all of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Division of Ser. No. 210,464, Nov. 26, 1980, Pat. No. 4,418,515. This application Sep. 2, 1983, Ser. No. 529,188

Int. Cl.⁴ B65H *9/00*

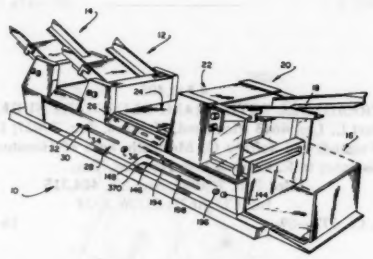
U.S. Cl. 271—226 **12 Claims**

1. A gauging apparatus for a sheet material handling system having sheet material engaging means, the apparatus comprising: means for receiving a specimen sheet material, the receiving means including means for framing a dimension of the specimen material, and means for positioning the sheet material engaging means as a function of the framing means to accommodate sheet material dimensioned in accordance with the specimen;

(a) wherein the framing means includes a first means for providing an abutment against which an end of the specimen is positioned, pointer means for engaging the opposite end of the specimen and means for adjusting the pointer means, the positioning means including means for posi-

tioning the material engaging means as a function of the position of the pointer means;

(b) wherein the means for adjusting the pointer means includes a belt, means mounting the belt in a configuration providing a genrally straight span, means securing the pointer means to the belt at the span and means for driving the belt; and



(c) wherein the means for positioning the sheet material engaging means comprises cam means, follower means engaging the cam means, means interconnecting the follower means and the sheet material engaging means and means for rotating the cam means, the rotating means comprising means driven by the belt driving means.

4,548,401

SHEET FEED APPARATUS

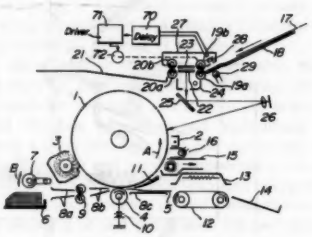
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Continuation of Ser. No. 950,310, Oct. 10, 1978, abandoned. This application Jun. 27, 1983, Ser. No. 507,911

Claims priority, application Japan, Oct. 13, 1977, 52-121882

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—265 **2 Claims**



1. An apparatus for feeding single sheets which are successively supplied one by one by manual operation of a user, said apparatus comprising:

a pair of rotatable sheet feeding rollers for receiving the single sheets directly from the user and for feeding each of the manually supplied sheets in a given feed direction, said rollers having their axes perpendicular to the feed direction;

sheet detection means arranged at an upstream position with respect to the sheet feeding rollers for detecting the presence of each of the sheets to produce a sheet detection signal upon the manual supply of each sheet;

means for delaying each sheet detection signal supplied from said sheet detecting means by a given constant time period sufficiently long for enabling an operator to manually set each detected sheet at a desired orientation of the edges of the sheet relative to said given feed direction, the orientation of each supplied sheet being independently variable relative to other supplied sheets and determined and set solely by the operator; and

driving means responsive to each said delayed sheet detection signal for initiating the rotation of said sheet feeding rollers to feed each supplied sheet in the same orientation relative to the given feed direction as manually set by the operator and after the passage of the given constant time period.

4,548,402

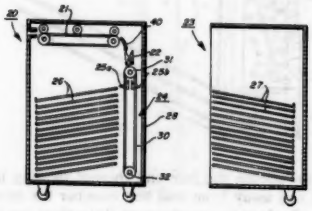
PAPER SORTING APPARATUS FOR A COPIER

Yoshiharu Namba, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Nov. 30, 1983, Ser. No. 556,753

Int. Cl.[4] B65H *29/58*

U.S. Cl. 271—290 **3 Claims**



1. A sheet sorting apparatus for a copier comprising a basic sorter array having vertically arranged bins, an additional array of vertically arranged bins, a sheet transport arranged to direct sheets from the copier to a discharge station, a vertical sheet transport arranged between said basic sorter and said additional array of bins, said vertical transport having first indexing means to selectively divert sheets to the bins of said basic sorter, and second indexing means to selectively divert sheets to the bins of said additional array, sheet path switching means adjacent said discharge station and arranged, when actuated to one control condition to divert sheets to said first indexing means and produce movement of sheets into the bins of said basic array, and when actuated to another control condition to divert sheets to said other indexing means and produce movement of sheets into the bins of said additional array.

4,548,403

SORTER

Toshio Matsui; Yasuhiro Doi; Keichi Kinoshita, and Kuniaki Ishiguro, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1982, Ser. No. 442,434

Claims priority, application Japan, Nov. 18, 1981, 56-185775; Apr. 26, 1982, 57-60858[U]; May 7, 1982, 57-77215; May 19, 1982, 57-74151[U]; Jun. 3, 1982, 57-83318[U]; Jun. 16, 1982, 57-90414[U]

Int. Cl.[4] B65H *39/11, 29/12*

U.S. Cl. 271—296 **4 Claims**

3. A sorter of the type in which distributing means moves relative to a plurality of fixed bins along the inlets to the bins to thereby distribute individual sheets into the bins, said sorter comprising:

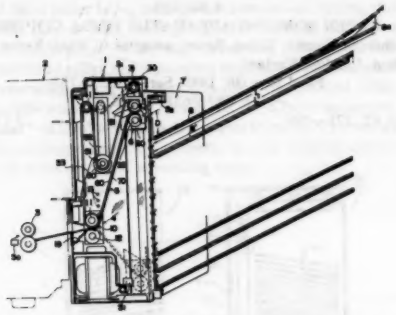
a pair of upper and lower shafts on the distributing means, and first upper roller member and a first lower roller member rotatably mounted on respective ones of said shafts;

a pair of second roller members fixedly mounted on the sorter for receiving sheets from a copying machine;

upper and lower belt members reeved around corresponding first and second roller members for receiving a sheet therebetween and transporting it between said belt mem-

bers, said belt shafts being spaced along said roller members from each other with the upper belt members alternating with the lower belt members; and

guide members idly rotatably mounted on said upper shaft and resting under gravity on at least one of the lower belt members and having a roll-shaped guide portion concentric with said upper shaft and a projecting portion extending therefrom in a direction opposite to the direction of transport of the sheet, said projecting portion having a



slanting surface on the free end thereof slanting in said direction and away from said belt member for receiving the edge of a sheet thereunder even if the sheet has curled during transport, and said projecting portion further having a concave roll-shaped guide recess on the side toward said belt with a profile substantially the same as the periphery of the first lower roller member for guiding the edge of the sheet to the nip of the roll-shaped guide portion and the lower belt member where said lower belt member goes over said first lower roller member.

4,548,404

METHOD AND APPARATUS FOR FORMING A STREAM OF PARTLY OVERLAPPING PAPER SHEETS

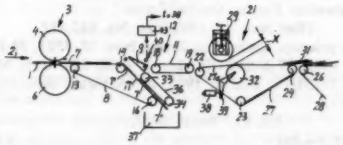
Eckhard Brandt, Norderstedt, and Friedrich Schultz, Hamburg, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 595,925

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312196

Int. Cl.[4] B65H *29/62, 29/66, 35/04*

U.S. Cl. 271—303 **15 Claims**



1. A method of forming a stream of partially overlapping sheets, particularly paper sheets, comprising the steps of conveying a series of successive randomly distributed satisfactory and unsatisfactory sheets at a first speed along a first portion of an elongated path; introducing successive satisfactory sheets between two spaced-apart conveyors which define a second portion of said path and whose speed is less than said first speed so that the satisfactory sheets are decelerated and successive decelerated sheets partially overlap the preceding decelerated sheets; removing unsatisfactory sheets from said path in a region ahead of said second portion; reducing the spacing between the conveyors which define said second portion of said path in response to removal of an unsatisfactory sheet from said path; and increasing the spacing between the conveyors upon introduction of a preselected number of satisfactory sheets into the second portion of said path following the removal of one or more unsatisfactory sheets from said path.

4,548,405

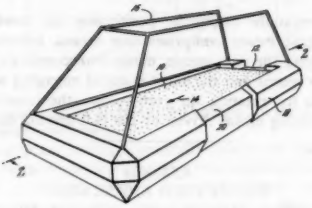
TREADMILL WITH TRAMPOLINE-LIKE SURFACE

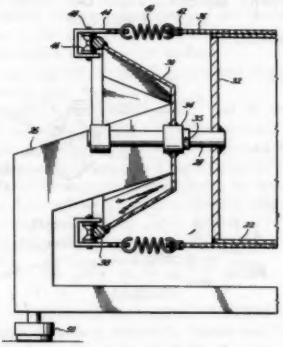
Robert C. Lee, 4643 Richmond, Houston, Tex. 77027; Larry J. Weigand, and Jeffrey O. Merideth, both of Houston, Tex., assignors to R. Clayton Lee, Houston, Tex.

Filed Feb. 7, 1983, Ser. No. 464,315

Int. Cl.[4] A63B *23/06, 5/18*

U.S. Cl. 272—69 **16 Claims**





1. A treadmill, comprising:

(a) an endless belt, the uppermost surface of which is adapted to form a flat exercising surface;

(b) first support means located within the endless belt at each end of the exercising surface for supporting and allowing the endless belt to be moved longitudinally;

(c) second endless support means spaced from and extending substantially along respective sides of the endless belt;

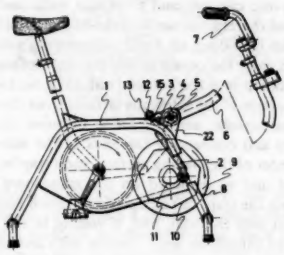
(d) a plurality of connecting means for connecting the edges of the endless belt to their respective second endless support means for continuously supporting the edges as the endless belt moves relative to the second endless support means; and

(e) said plurality of connecting means each including a spring means between an edge and the connection to said second support means, for providing trampoline-like resiliency to the support surface.

4,548,406
GYMNASTIC BICYCLE

Jose L. Beistegui Chirapozu, Vitoria, Spain, assignor to B.H. S.A., Madrid, Spain

Filed Aug. 2, 1983, Ser. No. 520,449
Claims priority, application Spain, Aug. 6, 1982, 266.835; Aug. 6, 1982, 266.836
Int. Cl.[4] A63B *69/16*
U.S. Cl. 272—73 9 Claims



1. An exercise device of the bicycle type, said device comprising:

a chassis adapted to be positioned stationarily;

a pedal assembly rotatably mounted on said chassis to enable a pedaling exercise by a user of the device;

an inertia flywheel rotatably mounted on said chassis by means separate from said pedal assembly, said inertia flywheel being rotatable in response to rotation of said pedal assembly, and said inertia flywheel having a polygonal surface;

a handlebar assembly;

means for mounting said handlebar assembly on said chassis for reciprocal pivotal movement relative thereto to enable a rowing execise by the user of the device;

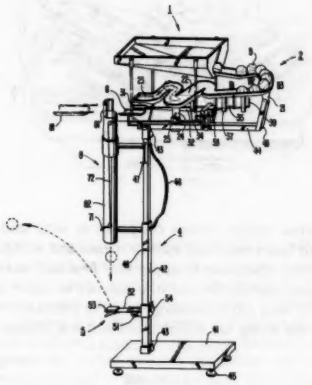
means for, upon rotation of said pedal assembly during a pedaling exercise, generating and transmitting vibrations to said handlebar assembly and thus to the arms of the user, said vibration generating and transmitting means comprising a lever having a first end connected to said handlebar assembly and a roller supported on a second end of said lever and in contact with said polygonal surface, such that upon rotation of said inertia flywheel as a result of pedaling of said pedal assembly said polygonal surface imparts vibrations to said roller, and thereby to said lever and said handlebar assembly; and

means for selectively interrupting generation and transmission of said vibrations, said interrupting means comprising a shaft rotatably mounted on said chassis, a manual control knob at a first end of said shaft for rotation of said shaft about the axis thereof, a second end of said shaft having first and second axially spaced abutting surfaces, and a plate fixed to said handlebar assembly to be abutted alternately by said first or second abutting surfaces, depending on the relative rotation position of said knob and said shaft, said handlebar assembly and said lever being pivotal about said mounting means between a first position when said first abutting surface abuts said plate, whereat said roller is in contact with said polygonal surface, and a second position when said second abutting surface abuts said plate, whereat said roller is spaced from said polygonal surface, thereby interrupting the generation of vibrations upon rotation of said inertia flywheel during a pedaling exercise.

4,548,407
TOSS BATTING TRAINER

Kazuhiro Sato, 7–39 chome, Kyokunan, Akita City, Akita 010, Japan

Filed Mar. 30, 1983, Ser. No. 480,583
Claims priority, application Japan, Apr. 8, 1982, 57-52057[U]
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R 4 Claims



1. A ball tossing training device comprising:

a self-supporting stand;

a ball receiver mounted on said stand above ground level;

an angularly adjustable ball track feeder for receiving balls from said receiver, said track feeder having a loading end and a discharge end;

means for adjusting the inclination of said ball track feeder to control the speed of a ball moving therealong;

means for intermittently automatically feeding a single ball at a time along said track feeder;

ball tossing means positioned below said discharge end of said track feeder for deflecting each ball discharged therefrom; and

a self-supporting stand including a telescopic rod comprised of an upper portion and a lower portion, said ball receiver and said ball track feeder being attached to said upper portion, and a spring attached at one end to said upper portion and at its opposite end to said lower portion whereby said upper portion may be telescoped down into said lower portion to lower said ball receiver and said ball track feeder and, upon release, the upper portion will spring back to its normal upper position.

4,548,408
BONUS BALL PINBALL GAME

Norman R. Clark, Burbank, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed May 6, 1983, Ser. No. 492,416
Int. Cl.[4] A63F *7/34*
U.S. Cl. 273—121 A 16 Claims

1. In a pinball type game, the combination comprising;

a play surface,

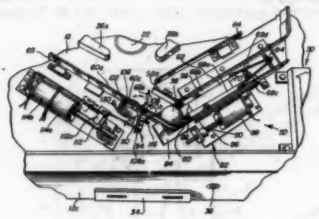
a pair of distinct game balls,

a first ball return and ejector means defining a first path of ball travel and distinct from said play surface and adapted to receive a selected one of said game balls and move it along the first path to a shooting position in response to a first predetermined signal,

second ball return and ejector means defining a second path of ball travel distinct from the first path and distinct from said play surface and adapted to receive the other of said balls and move it along the second path of ball travel to a

shooting position in response to a predetermined second signal,

gate means for directing a returning ball to said first ball return means and first path and alternatively directing the returning ball to said second ball return means and second path,



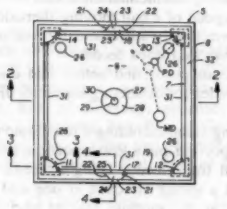
and control circuit means cooperative with said first and second ball return and ejector means and said gate means and being operative to apply said first and second predetermined signals thereto in a manner to move said game balls to their corresponding shooting positions in selective sequence along the selected defined and distinct paths.

4,548,409

GAME WITH SLIDABLE DISCS, GOAL POCKETS, AND RAIL TRAPS

Jaime A. Cacho, 488 Richmond Rd., Cleveland, Ohio 44143

Filed Mar. 2, 1983, Ser. No. 459,811
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—126 R **12 Claims**



1. An apparatus used in playing a game, comprising:

(a) a gameboard having a flat, smooth playing surface across which flat discs, used in playing the game, are slidable, the playing surface being bounded by an outer, peripheral edge;

(aa) a master disc and a plurality of playing discs used in playing the game, the master disc being larger than the playing discs and used to strike and propel the playing discs across the playing surface;

(b) a continuous bumper rail at the peripheral edge of the playing surface and extending vertically above the plane of the playing surface, when said surface is in a horizontal plane for playing the game, so that a disc, sliding across said surface and attempting to leave said gameboard, will strike said bumper rail and rebound therefrom;

(c) a plurality of pockets strategically located around the peripheral edge of the playing surface adjacent the bumper rail for receiving and holding discs shot therein, each of the pockets being sized larger than the master disc and being recessed below the playing surface, so that a slowly moving disc, upon entering the pocket, will fall, by gravity, into the pocket;

(d) means associated with each of the pockets for preventing fast moving discs from escaping the pockets once they are shot therein; and

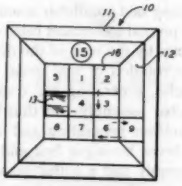
(e) at least one trap disposed adjacent the peripheral edge of the playing surface between a pair of pockets, the trap being recessed inwardly of the bumper rail in a direction away from the center of the playing surface such that the bumper rail is removed in the area of the trap which has a disc supporting surface which is flush with the playing surface, the trap being partially formed by adjacent walls of the bumper rail, which walls, in the area of the trap, are substantially normal to the plane of the playing surface, so that a disc can rebound from said walls and not become wedged therein, the walls of the bumper rail in the area of the trap including, (i) a pair of opposing sidewalls which extend from the center of the playing surface in converging relation into the bumper rail, (ii) a backwall connecting the ends of the sidewalls farthest from the center of the playing surface, and (iii) a line disposed on the playing surface and connecting the ends of the sidewalls closest the center of the playing surface, each trap being sized and shaped and so disposed on the gameboard that a disc, entering the trap, can escape therefrom if improperly shot too fast into the trap, and, if resting in the trap, can be knocked therefrom upon contact with another disc entering the trap.

4,548,410

NUMBER PUZZLE

Giuseppe Morrone, 48 E. 15th St., Huntington Station, N.Y. 11746

Filed Oct. 19, 1983, Ser. No. 543,670
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 S **5 Claims**



1. A number puzzle comprising:

(a) a housing including an exterior frame and an interior frame and means to interconnect said exterior frame and said interior frame one to the other;

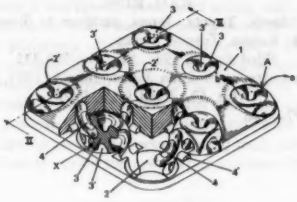
(b) said interior frame being formed with a fixedly disposed first recess, defined by walls formed on said interior frame, and a fixedly disposed second recess contiguous with a corner of said first recess and adjacent one corner thereof and of said interior frame;

(c) said exterior frame defining one wall of said second recess and said first recess defining an imaginary other wall for said second recess opposite said one wall;

(d) a plurality of numbered tiles being disposed in said first recess, and each of said tiles being individually slidably movable into and from said second recess, whereby tiles are movable so as to be arranged in a desired solution in said first recess;

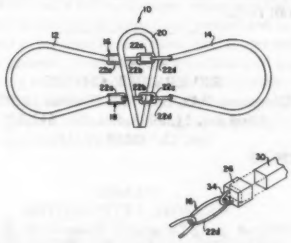
(e) said tiles consisting of nine tiles numbered 1–9 in seriatim, and arranged 3×3 in said first recess, and wherein the solution is to arrange the tiles in said first recess so that the number sum of each three tiles arranged horizontally, vertically or diagonally is 15.

4,548,411
PUZZLE TOY
Abraham Seidman, 10 Barzilai St., Holon, Israel
Filed May 23, 1984, Ser. No. 613,584
Claims priority, application Israel, Jun. 20, 1983, 69032
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 R 4 Claims



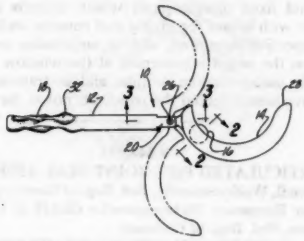
1. A plaything of the type referred to in the introductory paragraph above, comprising a casing in which fixed seats are provided for a multiple number of bodies, each of which is movable within its seat by being turned about two of its axes, the said bodies having the shape of cubes with rounded edges and rounded corners, recesses having been made in all six faces of each of said bodies, vicinal bodies being interconnected by cross shaped connectors which have bulbous end portions at the free ends of the cross arms, the said bulbous end portions extending matingly into the said recesses of the said bodies.

4,548,412
HORSESHOE PUZZLE
Demetrio I. Papadopulos, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007
Filed Oct. 31, 1983, Ser. No. 547,078
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—156 1 Claim



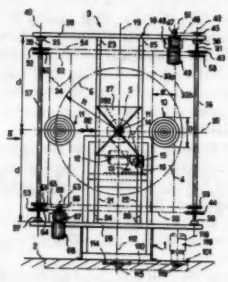
1. A puzzle which comprises:
(a) a pair of open end horseshoes:
(b) a pair of chains adapted to be connected between said open horseshoes; and
(c) a closed end horseshoe placed around said pair of chains whereby said closed end horseshoe may be removed from said pair of chains thus solving said puzzle, wherein each said chain comprises four links thereon that further comprises two sets of sleeves, each sleeve connected to an end link of said chains and adapted to be removeably mounted on an end of said open end horsehoes so that said chains can be removed and replaced when needed.

4,548,413
GAME DEVICE
Chris A. David, 17190 Garfield, Redford, Mich. 48240
Filed Feb. 6, 1984, Ser. No. 577,157
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—186 A 4 Claims



4. Golf game apparatus comprising: a ball propelling device, a ball, and a target, said ball propelling device comprising an elongated shaft, a hand grip at one end of said shaft to teach a golf stance, grip and swing, a chute member for holding a ball, said chute having a U-shaped cross section so as to form a trough, said U-shaped cross section being narrower at one end and progressively wider toward the other end, said chute member being pivoted to the other end of said shaft and being curved through a substantially circular arc of approximately 180 degrees, said shaft being swingable through an arc in a given plane with said pivot axis being disposed substantially perpendicular to the plane for delivery of a ball from said chute, said chute member being swingable through approximately 180 degrees relative to said elongated shaft during swinging movement of said game device for propelling said ball towards said target to facilitate a golf stance, grip and swing whereby the operator may practice a golf swing, stance and grip in a confined area by aiming a ball toward a target to improve the accuracy and technique of his golf swing.

4,548,414
APPARATUS FOR PRESENTING A TARGET AT A WINDOW
Bernard Denis, "Le Blavet", 49300 Cholet, France
Filed Feb. 25, 1985, Ser. No. 705,067
Claims priority, application France, Feb. 27, 1984, 84 02949
Int. Cl.[4] F41J 9/02
U.S. Cl. 273—367 18 Claims



1. Apparatus for presenting a target at a window, the apparatus comprising a support frame rigidly supporting an opaque panel which delimits a window, together with means for presenting a target at said window and downstream therefrom relative to a predetermined approximately horizontal shooting direction, the dimensions of said target perpendicular to said

shooting direction being less than the corresponding dimensions of the window, the apparatus including the improvement whereby the means for presenting the target comprise means for applying complex motion to the target, said complex motion combining rotation about an axis which is approximately horizontal and translation along a direction which is approximately perpendicular to the direction of said axis, said complex motion taking place downstream in said shooting direction from said fixed opaque panel which delimits the window, together with means for giving said rotation and said translation respective directions, and/or amplitudes and/or speeds such that the target is presented at the window in a manner which is pseudorandom in time and in trajectory between successive passes behind the panel, i.e. not at the window.

4,548,415

ARTICULATED PIPE JOINT SEAL ASSEMBLY

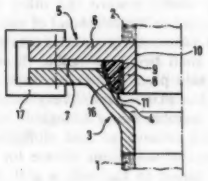
Peter Bendl, Wolfratshausen, Fed. Rep. of Germany, assignor to Feodor Burgmann Dichtungswerke GmbH & Co., Wolfratshausen, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,580

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248417

Int. Cl.⁴ F16J *15/06*; F16L *25/00*

U.S. Cl. 277—100 **17 Claims**



1. A seal assembly for an articulated coupling of a first and a second pipe each having a pipe end and a pipe axis, comprising

(a) a first flange having a flange axis and being adapted for affixation to the pipe end of said first pipe in axial alignment therewith;

(b) a first slide face on said first flange in a coaxial relationship therewith;

(c) a second flange having a flange axis and being adapted for affixation to the pipe end of said second pipe in axial alignment therewith; said second flange having

(1) an annular part including an engagement face situated at least approximately in a radial plane of said second flange and being oriented towards said first flange and

(2) a tubular nipple projecting axially from said annular part towards said first flange and having an at least approximately cylindrical outer circumferential surface;

(d) a sheet metal ring surrounding said tubular nipple and having a generally U-shaped cross section for defining a ring cavity open towards said engagement face; said sheet metal ring having

(1) an inner annular wall portion having an outer surface being in circumferential engagement with said tubular nipple and having a terminal edge axially spaced from said engagement face and

(2) an outer annular wall portion having an outer surface and a terminal edge axially spaced from said engagement face;

(e) a second slide face on said outer surface of said outer wall portion of said sheet metal ring; said second slide face being coaxial with said second flange and being surrounded by, and being in a sliding contact with, said first slide face;

(f) an annular filler mass of a sealing material received in said cavity; said annular filler mass extending axially beyond the terminal edges of said inner and outer annular wall portions and being in contact with said engagement face; and

(g) force exerting means for pressing said first and second slide faces axially to one another.

4,548,416

OIL-RING INCLUDING TWO RAIL RINGS AND AN EXPANDER-SPACER RING WHICH BITES INTO THE RAIL RING

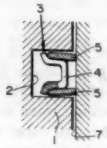
Yorishige Maeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 9, 1984, Ser. No. 598,431

Claims priority, application Japan, Jul. 21, 1983, 58-131858

Int. Cl.⁴ F16J *9/20, 9/22*

U.S. Cl. 277—140 **7 Claims**



1. A composite oil-ring for disposition in an oil ring groove of a piston reciprocally positioned in a cylinder comprising:

a pair of axially spaced rail rings;

an expander-spacer ring disposed between said rail rings to expand said rail rings, said expander-spacer ring being laterally extending U shaped in cross section providing rail supporting legs and an inwardly open channel between the legs of the U, integrally formed with a plurality of axially extending rail engaging portions circumferentially spaced at the inner periphery of each of said legs, and having a plurality of slots extending radially cut from the inner peripheries of said legs, said rail engaging portions having circumferential central portions with a curvature substantially the same as and in the same direction as the curvature of the inner periphery of said rail rings and circumferential end portions with a curvature, in a free state before contacting said rail rings, in the same direction as and smaller than the curvature of the inner periphery of said rail rings.

4,548,417

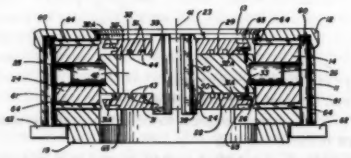
REVERSIBLE CHUCK

Anton L. Glommen, P.O. Box 749, Tiberias 14107, Israel

Filed Jul. 11, 1983, Ser. No. 512,227

Int. Cl.⁴ B23B *31/34*

U.S. Cl. 279—5 **11 Claims**



1. An indexing chuck comprising a chuck housing, said chuck housing having a center bore therethrough, the axis of the bore comprising the turning axis, a jaw carrier mounted in said central bore, said jaw carrier having a pair of pivot pins, said pivot pins being mounted on said chuck housing for permitting rotation of said jaw carrier about a pin axis substantially perpendicular to the axis of the bore, a plurality of work-

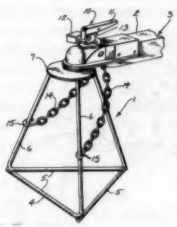
piece chucking jaws mounted in said jaw carrier and movable toward and away from axis of said bore, threadable means for moving the jaws inwardly and outwardly upon rotation of the threadable means about the axis of the bore, an outer housing rotatably mounted on the exterior of the chuck housing and rotatable relative to said chuck housing about the axis of the bore, means carried by the outer housing selectively movable to engage the threadable means and upon rotation of the outer housing operable for moving said jaws toward the axis of the bore to clamp a workpiece positioned along said axis, said means carried by the outer housing being movable to position clearing the periphery of the jaw carrier, and a mechanical latch plate movable from a latched position wherein it will prevent rotation of the jaw carrier about the axis of said pivot pins, to a position wherein it will clear said jaw carrier and permit said jaw carrier to be pivoted on said pivot pins, said jaw carrier having means for receiving said latch plate at 180° spaced positions to permit the jaw carrier to rotate 180° on said pivot pins.

4,548,418

TRAILER SUPPORT STAND

Donn Wendorff, Rte. 1, Mayville, Wis. 53050

Filed Jun. 20, 1983, Ser. No. 505,988
Int. Cl.⁴ B60S *9/02*
U.S. Cl. 280—1 **9 Claims**



1. A trailer support stand, comprising a polygonal base having a plurality of outer edges, a plate spaced above the base, support means interconnecting the base and the plate, a ball mounted above the plate, the peripheral edge of the plate extending a substantial distance radially beyond the outer surface of the ball, and a stem interconnecting said ball and said plate, said stem including an upper end connected to the ball and a lower end connected to said plate, said lower end having a substantially greater cross sectional area than said upper end, a socket coupling member on the tongue of the trailer adapted to lockingly engage the ball to thereby support the trailer tongue above ground, said stand being non-tipping regardless of movement applied to the trailer.

4,548,419

MOTORCYCLE SIDECAR

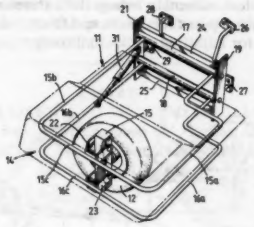
Keith R. Pigott, 2 Wayside Cottages, Long La.; Michael J. Macartney, 1 Wayside Cottages, Long La., and Alan S. Young, Boulac Cottage, Upper St., all of Southrepps, Norwich, Norfolk, England

Filed Nov. 9, 1983, Ser. No. 550,480
Claims priority, application United Kingdom, Nov. 16, 1982, 8232732
Int. Cl.⁴ B62K *27/02*
U.S. Cl. 280—203 **3 Claims**

1. A motorcycle sidecar including fastening means detachably fixable to said motorcycle;

an upper link means and a lower link means each consisting of an elongate forward member and an elongate rear member, each of said members being pivotally connected at one of their ends to said fastening means, and a coupling member joining together the other ends of the forward and rear members;

post means pivotally connected to said upper link means and said lower link means at a location remote from said fastening means; and



rotatable wheel means attached to said post means,

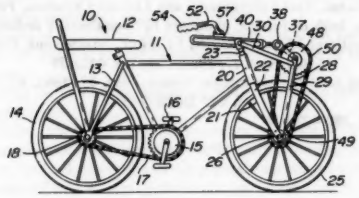
said upper and lower coupling members being disposed outwardly of said wheel means.

4,548,420

RECIPROCATING AND OSCILLATING DRIVE MECHANISM

Anthony F. Patroni, Jr., 9005 Amherst Ave., Margate, N.J. 08402

Filed Dec. 5, 1983, Ser. No. 558,290
Int. Cl.⁴ B62M *1/16*
U.S. Cl. 280—224 **11 Claims**



1. A drive mechanism comprising a rotary crank shaft, a crank arm extending radially from said crank shaft, a crank pin extending from said crank arm generally parallel to said crank shaft, a guide mounted in radially spaced relation with respect to said crank shaft, a connecting rod pivotally connected at one region to said crank pin for rotation therewith, a yoke adapted to slide and oscillate with respect to said guide and secured to said connecting rod at a location spaced from said one region, and manual operating means connected to said yoke for sliding and oscillating the latter relative to said guide to rotate said crank pin and drive said crank shaft.

4,548,421

RECUMBENT VEHICLE

David M. Wiener, Westport, Conn., assignor to W² Vehicle Design & Development, Inc., Westport, Conn.

Filed Jul. 21, 1983, Ser. No. 516,127
Int. Cl.⁴ B62K *5/02*
U.S. Cl. 280—281 LP **14 Claims**

10. A recumbent vehicle frame comprising:

a single, bowed tubular member having a front end and a rear end;

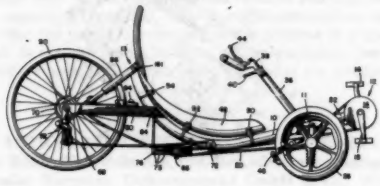
a rear wheel fork assembly mounted along the length of said tubular member toward the rear end thereof;

a pair of front wheel struts, for accommodating a pair of front wheels, mounted along the length of said tubular member toward the front end thereof;

a steering post tube mounted along the length of said tubular member toward the front end thereof;

a crank assembly support tube telescopically engaged with the front end of said tubular member;

means for adjusting the slack in a drive chain extending between said crank assembly support tube and said rear wheel fork assembly when the extension of said crank assembly support tube from said front end is adjusted, said means for adjusting slack comprising:



a bracket, containing a plurality of slots, mounted to said tubular member intermediate said front wheel struts and said rear wheel fork assembly;

a first chain pulley;

means for interchangeably mounting said first chain pulley in any of said slots;

a second chain pulley mounted to said tubular member; and

means for routing said drive chain in a zigzag arrangement around said first and second chain pulleys.

4,548,422

BICYCLE FRAME HAVING AN ASSEMBLED-UNIT SHELL STRUCTURE

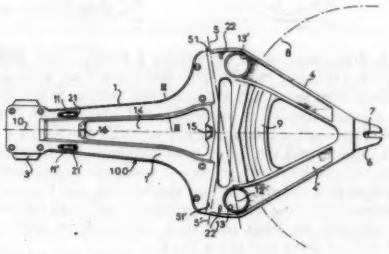
Diaz Michel, Tain l'Hermitage, and Loeillet Christian, Ferolles Atilly, both of France, assignors to Manufacture Industrielle de Cycles et Motocycles - M.I.C.M.O., Machecoul, France

Filed Nov. 17, 1982, Ser. No. 442,459

Claims priority, application France, Nov. 17, 1981, 81 21447

Int. Cl.⁴ B62K *3/02*

U.S. Cl. 280—281 R **5 Claims**



1. A bicycle frame having a shell structure, said frame comprising two at least generally longitudinally symmetrical shells which are attached to one another along a vertical longitudinal assembly plane, each of said two shells having a horizontal longitudinal plane of symmetry, said frame having an at least generally vertical sleeve adapted to mount a front fork, a first passage adapted to mount a support insert for a seat shaft, and a first housing adapted to mount a crank gear, said sleeve and said first passage being symmetrical about said vertical longitudinal assembly plane and said first housing being perpendicular to said vertical longitudinal assembly plane, said horizontal longitudinal plane of symmetry dividing said shells between said at least generally vertical sleeve and said first passage into two symmetrical girder elements, said first passage having a central axis and said first housing having a central axis which intersects the central axis of said first passage, the central axis of said first passage being forwardly inclined relative to said horizontal longitudinal plane of symmetry such that the upper end of said first passage is forward of the lower end of said first passage, said frame additionally having a second passage which is also symmetrical about said vertical longitudinal assembly plane and which has a central axis which is rearwardly inclined relative to said horizontal longitudinal plane of symmetry such that the lower end of said first passage is forward of the upper end of said first passage, and said frame additionally having a second housing which is also perpendicular to said vertical longitudinal assembly plane, said second housing having a central axis which intersects the central axis of said second passage.

4,548,423

UNIVERSAL TRAILER HITCH

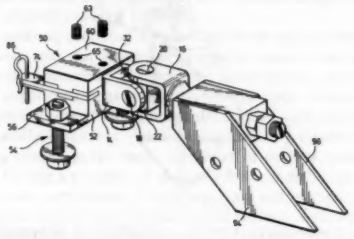
Trevor Craven, 401 Main St., Woodstock, Ontario, Canada N4S 1T5

Filed Jan. 23, 1984, Ser. No. 573,223

Claims priority, application Canada, Feb. 7, 1983, 421047

Int. Cl.⁴ B60D *7/00*

U.S. Cl. 280—492 **13 Claims**



1. A trailer hitch for detachably connecting a trailer to a towing vehicle comprising, in combination:

a universal joint having a pair of pivotally interconnected yokes, each yoke having a longitudinal axis and mounted for pivotal movement about a transverse axis,

a shaft secured to one yoke in axial alignment with the yoke longitudinal axis,

a bearing block journalled on said shaft for rotation of the shaft therein,

means for restraining said shaft from axial separation from said bearing block,

a second shaft secured to the other yoke in axial alignment with the longitudinal axis of said yoke, said second shaft having a free end and an annular shoulder formed on said free end,

a connector adapted to receive said second shaft for releasable engagement, said connector comprising a base having a longitudinal groove formed therein for receiving said second shaft, a closure member pivotally mounted on said base adapted to co-operate with the base when closed to rigidly lock the second shaft within the groove of the base of the connector,

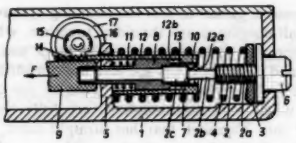
means for connecting one of said bearing block and said connector to the towing vehicle and means for connecting the other of said bearing block and connector to the trailer whereby said trailer is free to pivot horizontally and vertically relative to the towing vehicle and is free to rotate longitudinally relative to said towing vehicle.

4,548,424

SAFETY SKI BINDING RELEASE MECHANISM

Engelbert Spitaler, Wiener Neudorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Oct. 13, 1983, Ser. No. 541,600
Claims priority, application Austria, Oct. 19, 1982, 3836/82
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—612 **6 Claims**



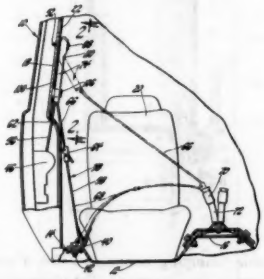
1. A safety ski binding having a release mechanism which comprises at least one sole holder which engages a two-part slide member supported for movement against the force of a spring, coupling means for releasably coupling the slide member parts to each other and releasable in dependence on movement of the slide member, and a binding part movable to a position in which it effects a release of the coupling means, wherein one slide member part carries one abutment for the spring and, after the release of the coupling means, is returned to an initial position under the urging of the spring, wherein a further abutment for the spring is formed by a housing part of the binding, and wherein the amount of movement of the slide member is sensed by a potentiometric motion pickup which produces electrical signals which are processed in dependence on their time duration in an electronic circuit and, upon exceeding a predetermined limit value prior to a mechanical release of the coupling means, cause the circuit to actuate drive means for effecting movement of the binding part which releases the coupling means.

4,548,425

SHEATH FOR STORING AND PRESENTING SHOULDER BELT

Keith M. Evans, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1983, Ser. No. 563,130
Int. Cl.⁴ B60R *21/10*
U.S. Cl. 280—808 **4 Claims**



1. In a motor vehicle occupant restraint belt system having a slide loop mounted on a pillar for slidably mounting the belt and defining a retractable portion of the belt extending vertically along the pillar from a retractor mounted below the slide loop and a restraint portion movable between an occupant restraining position extending diagonally across the occupant and a stored position extending along the pillar in parallel relationship with the retractable portion, a device for retaining the restraint portion in the stored position comprising:

a sheath mounted on the vehicle body in conjunction with and enclosing the slide loop, said sheath having a sleeve portion enclosing a segment of the restraint portion of the belt and movable with the restraint portion between its restraining position and stored position; and

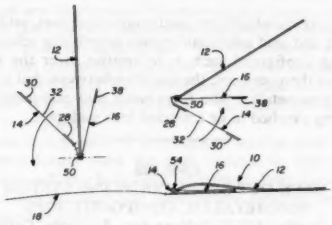
retainer means acting between the pillar and the sheath sleeve portion below the slide loop and adapted to retain the sleeve portion flat against the pillar in its position retaining the restraint portion of the belt in the stored position against the pillar.

4,548,426

REPORT COVER AND METHOD OF MAKING

William E. Lockhart, 7324 Campbell Rd., Dallas, Tex. 75248

Filed Nov. 29, 1982, Ser. No. 445,148
Int. Cl.⁴ B42D *3/00*
U.S. Cl. 281—29 **6 Claims**



1. A method of forming a report cover comprising the steps of:

securing a report between first edges of front and back panels along one edge of the report;

forming at least three parallel hinges in the front panel generally parallel to and proximate the first edge of the front panel;

folding the front panel about the hinges to cover the edge of the report;

securing the front and back covers together to bind the report along a line spaced sufficiently from the first edge of the back panel to permit pivotal motion about selected ones of said hinges to facilitate use of the report; and

forming at least one hinge in said back panel generally parallel to and proximate the first edge of the back panel, portions of the front and back panels between the first edges and closest hinges thereto and the edge of the report pivoting about the closest hinges to facilitate use of the report.

4. The report cover formed by the method of claim 1.

4,548,427

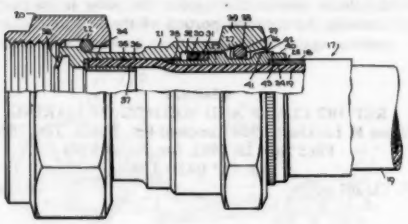
STRAIN ACCOMMODATING FLUID CONDUIT ASSEMBLY AND FITTING THEREFOR

Irving D. Press, West Orange, and Charles S. Lane, Livingston, both of N.J., assignors to UMC Industries, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 295,384, Aug. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 237,280, Feb. 23, 1981, abandoned. This application Oct. 20, 1981, Ser. No. 313,161
Int. Cl.⁴ F16L *9/14*
U.S. Cl. 285—55 **31 Claims**

1. A fitting for a fluid conduit assembly in which the conduit includes at least a fluid impervious solid metallic tube, said fitting comprising a component part having at one of its ends means for connecting said fitting to another element, additional means located at the other end of said component part for attachment to an end of said metallic tube with a fluid-tight connection, means joining said additional means to said component part with provision for limited movement at least axi-

ally between said additional means and said component part, and means for independently attaching the interior of said component part with a fluid-tight seal to an end of a non-metallic fluid impervious tube where said non-metallic tube is sized to make a substantially snug fit within said additional means



and projects therefrom into said component part, said component part and said additional means interfitting telescopingly and being configured such as to restrict, over the range of movement therebetween, the gap therebetween that is bridged by said non-metallic tube to prevent said non-metallic tube from being pinched in or extruded into said gap.

4,548,428

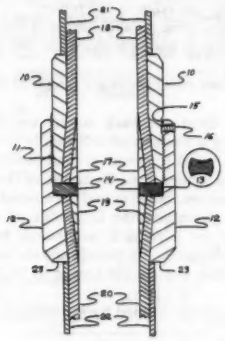
ANTI BACK-OUT STEEL COUPLING SYSTEM FOR NONMETALLIC COMPOSITE PIPE

James L. Ruhle, 2535 E. Balfour Ave., Fullerton, Calif. 92631

Filed Oct. 29, 1984, Ser. No. 665,995

Int. Cl.[4] F16L *33/18*

U.S. Cl. 285—90 **1 Claim**



1. The invention of an anti back-out steel coupling system for nonmetallic composite pipe comprising:

an inner tapered steel friction sleeve that is pressed into the end of one piece of longitudinally-reinforced composite pipe,

a threaded steel male half coupling tapered on its interior surface against which the longitudinally-reinforced composite pipe is compressed and gripped by the inner tapered steel friction sleeve,

a second inner tapered steel friction sleeve that is pressed into the end of a second piece of longitudinally-reinforced composite pipe,

a threaded steel female half coupling tapered on its interior surface against which the second longitudinally-reinforced composite pipe is compressed and gripped by the second inner tapered steel friction sleeve,

an outer wall of concentrically-wound composite pipe, which confines the male half coupling at its unthreaded shoulder, discouraging the longitudinal movement of the male half coupling relative to the longitudinally-reinforced composite pipe in a direction toward the concentrically-wound outer wall of composite pipe,

a second outer wall of concentrically-wound composite pipe, which confines the female half coupling at its unthreaded shoulder, discouraging the longitudinal movement of the female half coupling relative to the longitudinally-reinforced composite pipe in a direction toward the second outer wall of concentrically-wound composite pipe,

a compressible gasket to seal the coupling system when the two half-couplings are threaded together, which in the uncompressed state is covex on its inner and outer side edges and concave on its top and bottom surfaces,

the same gasket, which is transformed in the compressed state, when both half-couplings are fully threaded together into a gasket that has straight-sided edges and straight-sided surfaces on the top and bottom of the gasket resulting in an internally-flush central passage through the coupling system,

a plurality of longitudinal grooves cut into the male half-coupling at right angles to and across the threads at the upper part of the threaded interval,

a plurality of set screws threaded into and around the top perimeter of the female half-coupling, and arranged in such a manner that they can be threaded into coinciding grooves in the male half-coupling which prevents the rotation of one half-coupling with respect to the other.

4,548,429

RELEASABLE CLAMPING CONNECTION

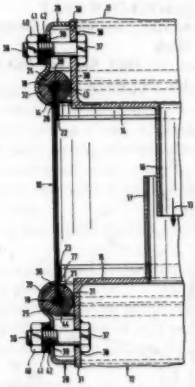
Günther Merz, Neu-Isenburg, Fed. Rep. of Germany, assignor to Korema GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,350

Claims priority, application European Pat. Off., Oct. 11, 1982, 82109399.4

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—236 **20 Claims**



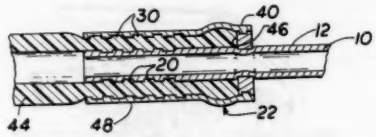
1. A releasable clamping connection for a pressure tight connection between two elements, the clamping connection comprising a gasket means, an edge bead provided at respective axial ends of said gasket means, a pair of elastic clamping rings each having a slot means for respectively accommodating portions of the axial ends of the gasket means, a clamping means for clamping the respective clamping rings against said edge beads and against portions of the respective elements, said clamping means each including a portion having a cross section complementary to an outside profile of the clamping rings, and means for mounting said clamping means on the respective elements.

4,548,430

CRIMPED HOSE FITTING

Steven D. Haubert, Van Wert, Ohio, and Stephen T. Indrelunas, Fort Wayne, Ind., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Apr. 18, 1983, Ser. No. 486,048
Int. Cl.[4] F16L *33/20*
U.S. Cl. 285—256 **5 Claims**



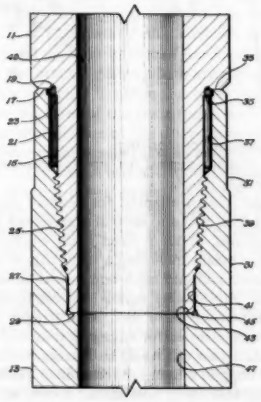
2. A crimped fitting for flexible hose comprising, in combination, a tubular metal deformable nipple having an outer diameter, an annular socket concentrically circumscribing at least a portion of said nipple having an inner end and an inner diameter, and an annular metal deformable cap having an inner diameter less than the nipple outer diameter deforming the aligned nipple outer diameter inwardly sealingly engaging said nipple and an outer diameter including an annular circumferential groove sealingly engaging said socket inner diameter, said socket being radially deformed inwardly into said groove to form the sealed relationship with said cap, the radial deformation of said socket into said groove simultaneously radially contracting said cap to deform the aligned nipple outer diameter inwardly.

4,548,431

TOOL JOINT WITH INTERNAL/EXTERNAL MAKE-UP SHOULDERS

James R. Hall, Huffman, and Robert A. Cunningham, Bellaire, both of Tex., assignors to Hughes Tool Company - USA, Houston, Tex.

Continuation-in-part of Ser. No. 331,934, Dec. 17, 1981, abandoned. This application Oct. 16, 1984, Ser. No. 661,533
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334 **2 Claims**



1. In a drill pipe tool joint having a pin with external threads formed between an external shoulder and a pin face, and a box with internal threads located below a box face for connection with the pin, the improvement comprising:

the box having an internal annular shoulder and a counterbore section between the internal threads and box face;

the pin having a base section between the external shoulder and the external threads and a nose section between the pin face and external threads;

the lengths and thicknesses of the counterbore, base and nose sections being selected so that when the drill pipe tool joint is made-up to one-half of its yield strength, the box face will tighten against the external shoulder to a pressure that exceeds any pressure being exerted by the pin face against the internal shoulder, with the pin face tightening against the internal shoulder if additional torque during drilling is encountered;

the lengths and thicknesses of the counterbore, base and nose sections being selected so as to cause the counterbore section to resiliently compress and the base section to resiliently stretch a sufficient amount to allow the pin face to contact the internal shoulder before the yield strengths of the base and counterbore sections are reached, the length and thickness of the nose section being selected so as to cause the nose section to resiliently compress and to reach yield strength no later than the time at which the base and counterbore sections reach yield strength;

the base section and the counterbore section each having a length that is at least one-third the length of the threads when engaged;

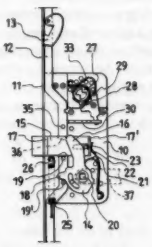
the base section and the counterbore section each having a greater length than the nose section, so that the nose section will reach its yield strength no later than the time at which the base and counterbore sections reach their yield strengths.

4,548,432

LATCH ASSEMBLY

Sigurd W. Bengtsson, Bruksgatan 17, 41451 Göteborg, Sweden

Filed Apr. 29, 1983, Ser. No. 489,775
Claims priority, application Sweden, Apr. 29, 1982, 82-02701
Int. Cl.[4] E05C *9/02*
U.S. Cl. 292—8 **12 Claims**



1. A latch assembly for being installed on the edge of a closure for holding the closure in a closed position, said closure having a recess in such edge, said assembly comprising:

(a) an espagnolette edge bar adapted to be secured to the closure's edge;

(b) a casing secured to said edge bar for being received in the recess of the closure;

(c) at least one bolt disposed remotely from said casing, and supported by said edge bar for movement to a locking position and to a retracted position;

(d) an espagnolette rod operatively connected to said one bolt for maneuvering it;

(e) a further bolt slidably supported in said casing;

(f) a handle-controlled operating member in said casing for reciprocating said rod and said further bolt; and

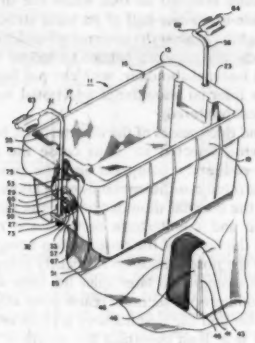
(g) a spring device acting on said rod in a direction to retract said one bolt in response to the return of the handle from the position thereof effecting the extension of said one bolt.

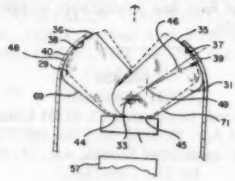
4,548,433

LATCH MECHANISM

Ronald D. Kay, 3513 Hazeline, Forth Worth, Tex. 76103

Filed May 11, 1984, Ser. No. 609,458
Int. Cl.[4] E05C *3/06, 3/16, 7/00, 9/10*
U.S. Cl. 292—49 **4 Claims**





1. A latch mechanism, comprising:

at least one latch dog pivotably mounted on a base member, said dog having a curved end region adapted to contact a curved work surface of an associated stop member, said dog being pivotable between a release position in which said curved end region is apart from said work surface to allow relative movement between said base member and stop member and an engaged position in which said curved end region contacts said work surfaces; and

wherein the radius of curvature of said dog end region matches the radius of curvature of said stop member work surface whereby said dog end region fully mates with said work surface in the engaged position, the pivot point of said dog being offset from the center point of the radius of curvature of said curved end region of said dog to cause said dog end region to avoid contact with said stop member work surface while being moved to and from the release position.

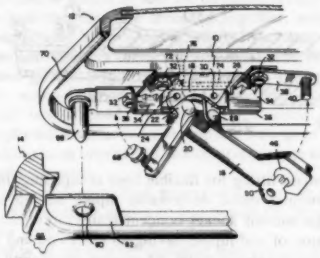
4,548,434

LATCH FOR REMOVABLE VEHICLE ROOF PANELS

William E. Princell, 10803 Wildwood Dr., Indianapolis, Ind. 46256

Filed Sep. 13, 1982, Ser. No. 416,881
Int. Cl.[4] E05C *3/08*
U.S. Cl. 292—223 **10 Claims**

1. A latch assembly for removable vehicle roof panels comprising a handle for selectively releasably retaining the panel on the vehicle, means for mounting the handle upon the panel for movement between a first latching orientation for securing the panel to the vehicle and a second non-latching orientation in which the panel is removable from the vehicle, a first locking member, means for mounting the first locking member upon the panel, a second locking member, the second locking member cooperating with the first to secure the handle in the first orientation, the second locking member being operable to permit movement of the second locking member out of locking cooperation with the first locking member to permit the handle to be moved from the first orientation to the second, means for mounting the second locking member upon the handle, the first locking member comprising a threaded stud, the handle comprising means defining a generally right circular cylindrical



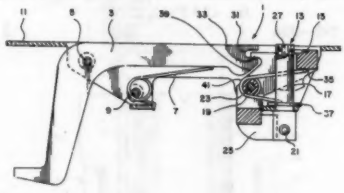
aperture having at least one lug projecting from the cylindrical interior wall thereof and the second locking member comprising a key-actuable lock plug having tumblers which engage the lug when the key is not inserted into it, insertion of the key retracting the tumblers from lug engagement and permitting rotation of the plug, and means providing a threaded passageway for selectively engaging the threaded stud, rotation of the plug driving the means providing the threaded passageway selectively into and out of engagement with the threaded stud.

4,548,435

LATCH ASSEMBLY CHANNEL

William R. Bourne, Anaheim, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Apr. 4, 1980, Ser. No. 137,554
Int. Cl.[4] E05C *3/02*
U.S. Cl. 292—229 **11 Claims**



1. A latch assembly comprising:

a latch bolt means adapted for pivotal movement about a fixed latch bolt pivot;

a latch trigger means adapted for pivotal movement and between at least first and second preselected latch trigger means positions, about a fixed latch trigger pivot, said latch trigger means including a latch trigger means interlocking means and said latch bolt means including a latch bolt means interlocking means for engaging said latch trigger means protrusion, said latch trigger means interlocking means adapted for engaging said latch bolt means interlocking means when said latch trigger means is at said first latch trigger means predetermined position and for disengaging said latch bolt means recess at said second latch trigger means predetermined position;

a shaft means adjacent said latch trigger means adapted for rotating a shaft into engagement with said latch trigger means and for pivoting said latch trigger means to said second predetermined latch trigger position said shaft

means further including a frame within which said shaft is mounted; and

a spring urging a shoulder of said latch trigger means away from a shoulder of said shaft means such that the pivoting of said latch trigger means from said first preselected latch trigger means position to said second preselected latch trigger means position compresses said spring.

4,548,436

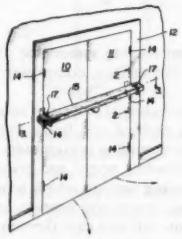
SECURITY LOCK FOR DOUBLE DOORS

Theodore M. Cole, Jr., Rte. 1, Box 385, Fishersville, Va. 22939

Continuation of Ser. No. 430,530, Sep. 30, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 641,068

Int. Cl.⁴ E05C *19/18*

U.S. Cl. 292—292 **2 Claims**



1. A security assembly comprising a door frame including vertical stop rails on the opposite sides of the frame, the frame having exterior and interior vertical faces, the stop rails being adjacent to the exterior face of the door frame, a pair of horizontal swingable doors within the door frame and having interior faces which are flush with the interior face of the door frame when the doors are closed, the doors having exterior faces which are in close opposing relationship to the stop rails when the doors are closed, vertical axis hinges swingably securing the doors to the opposite sides of the door frame and being arranged in horizontally aligned pairs and the hinges projecting beyond the interior face of the door frame, a pair of identical thin flat bracket plates which are elongated horizontally during use disposed between the outer vertical edges of the doors and the sides of the door frame and projecting inwardly of the interior face of the door frame substantially at right angles thereto, the bracket plates having lower horizontal edges resting on the tops of one horizontally aligned pair of the hinges, said bracket plates having openings formed therethrough in their portions projecting inwardly of the interior face of the door frame and the openings having edges which are substantially flush with the interior face of the door frame, short right angular vertical flanges on the exterior ends of the bracket plates extending from the bracket plates toward the center of the door frame, the flanges overlapping the exterior faces of the doors adjacent to the stop rails and lying between the exterior faces of the doors and stop rails whereby the bracket plates are captively held in use positions, and a single elongated horizontal locking bar engaging through the openings of the bracket plates and horizontally spanning the interior faces of the doors in substantial contact therewith when the doors are closed and having end portions in overlapping engagement with the interior face of the door frame at the opposite sides of the door frame.

4,548,437

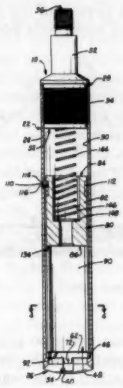
DOWNHOLE WELL FISHING ASSEMBLY

Darrel Driskill, Ardmore, Okla., assignor to Larson Supply Company, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 461,440, Apr. 15, 1983, abandoned. This application Jun. 14, 1984, Ser. No. 620,625

Int. Cl.⁴ E21B *31/02*

U.S. Cl. 294—86.3 **16 Claims**



1. A fishing assembly for use in retrieving a downhole member from a well, comprising:

a body member having a cylindrical cavity formed in central portions thereof about a cavity axis, wherein an entrance port extending to one end of the cavity is formed through one end of the body member whereby portions of a rod can be inserted into said cavity via said entrance port;

a slide member disposed in said cavity for rotation about the cavity axis and reciprocation along the cavity axis from a lower axial position of the slide member adjacent said one end of the cavity and an upper axial position of the slide member adjacent the opposite end of the cavity;

camming means formed partially on the body member and partially on the slide member for relating the angular position of the slide member to the axial position of the slide member and for turning the slide member through one half turn in the body member for each reciprocation of the slide member from the lower axial position thereof, to the upper axial position thereof, and back to the lower axial position thereof, whereby the slide member can be positioned in either of two angular positions at such time that the slide member is in the lower axial position thereof; and

capture means formed partially on the body member and partially on the slide member for capturing an enlargement on a rod inserted into said cavity at such times that the slide member is in one of said angular positions defined for the lower axial position of the slide member and for releasing said enlargement at such times that the slide member is in the other of said angular positions defined for the lower axial position of the slide member.

4,548,438

MOBILE CAMPING APPARATUS

Robert H. Myers, 983 Moorefield Rd., Springfield, Ohio 45502

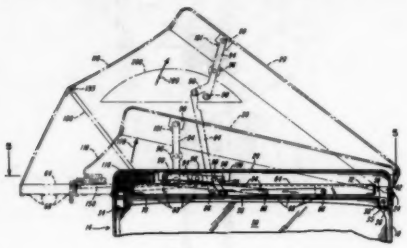
Filed Sep. 23, 1983, Ser. No. 535,031

Int. Cl.⁴ B60P *3/34*

U.S. Cl. 296—160 **6 Claims**

6. Mobile camping apparatus of the type which includes a van type of automotive vehicle provided with a body having an upper front portion and an upper rear portion and upper side portions, the improvement comprising a roof pivotally

attached to an upper side portion of the body, a transverse horizontal rail member attached to the body adjacent the upper front portion and a transverse horizontal rail member attached to the body adjacent the upper rear portion, horizontal bed structure supported upon the rail members, the bed structure having a forward portion adjacent the upper front portion of the body and a rear portion adjacent the upper rear portion of the body, the bed structure being movable horizontally upon the rail members from a position between the upper side portions to a position in which at least a part of the forward portion and a part of the rear portion of the bed structure is positioned laterally beyond an upper side portion of the body, a



pair of arm members, there being an arm member pivotally attached to the forward portion of the bed structure, and an arm member pivotally attached to the rear portion of the bed structure, a pair of levers, each lever being pivotally attached to one of the arm members, each lever also being pivotally attached to the roof, motor means, drive means joining the motor means to the bed structure for movement of the bed structure upon the rail members, whereby operation of the motor means moves the bed structure, and movement of the bed structure forces the arm members to move the levers and movement of the levers forces the roof to move pivotally with respect to the body.

4,548,439

TELESCOPIC WINCH DRIVE

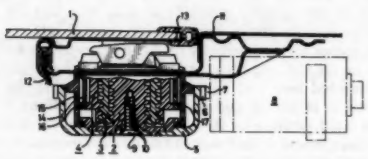
Horst Bienert, Gauting, and August Hirschberger, Munich, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Feb. 2, 1983, Ser. No. 463,255

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216402

Int. Cl.[4] B60J *7/00*

U.S. Cl. 296—223 **17 Claims**



1. A telescopic winch drive for tilting a cover closing a roof opening in a motor vehicle, comprising a plurality of telescopingly interconnected screw-threaded parts of which one of an outermost and an innermost of the screw-threaded parts is connected with an axially fixed wheel and the other of which screw-threaded part is constructed for connection with the cover, wherein a crown gear is provided on an outside jacket of said wheel, said crown gear meshing with a drive gear of an electric motor unit, and the engagement between said crown gear and drive gear being releasable, wherein said releasable engagement between the crown and drive gears is achieved by said electric motor unit being pivotally mounted in a manner enabling pivotal displacement of the said drive gear relative to said crown gear.

4,548,440

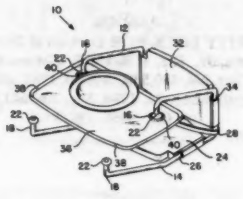
PORTABLE CHAIR AND IMPROVED TRAY WITH LOCKING CONTAINER

Jacques P. Meslin, and Laurence C. Meslin, both of 1540 Harksell Rd., Ferndale, Wash. 98248

Continuation-in-part of Ser. No. 513,036, Jul. 12, 1983, abandoned, and Ser. No. 495,525, May 17, 1983,. This application May 4, 1984, Ser. No. 607,300

Int. Cl.[4] A47B *39/00*

U.S. Cl. 297—174 **6 Claims**



1. A portable infant feeding system for use in conjunction with a substantially flat surface, comprising the combination of:

a hook-on chair, including (1) a pair of substantially parallel frame members, each of said frame members having an upper outwardly extending portion which terminates in a downwardly extending upper end portion and a lower outwardly extending portion which terminates in an upwardly extending lower end portion, said end portions including resilient, anti-skid caps thereon for engaging the surface and positioned to substantially oppose one another when placed on opposite sides of said surface in counterbalanced fashion; (2) a seat positioned substantially parallel to the plane of said surface and extending transverse to and releasably coupled to said frame members; (3) an upwardly extending back, said back positioned in substantially perpendicular relation to the plane of said surface and extending transverse to said releasably coupled to said frame members; and

a tray, having openings therein adapted to receive said upper-end caps of said frame members, the caps and openings shaped such that the caps apply substantial downward pressure on the sidewalls of the openings in the tray on compression of the caps by the weight of an infant placed in the chair to lock the tray in place without affecting the anti-skid characteristics of the caps in contact with the surface, said tray having retaining means thereon for releasably retaining a suitable container.

4,548,441

STACKING CHAIR

Richard K. Ogg, c/o Keneco, R.R. 3, Box 34, Littlestown, Pa. 17340

Filed Jan. 22, 1982, Ser. No. 341,624

Int. Cl.[4] A47C *3/04*

U.S. Cl. 297—239 **15 Claims**

1. A chair comprising:

a first integral tube having a front leg-forming portion, seat perimeter-forming portion, and back perimeter-forming position, said front leg-forming and back perimeter-forming portions being generally parallel to each other and generally perpendicular to said seat perimeter-forming portion;

a second integral tube substantially identical to said first tube;

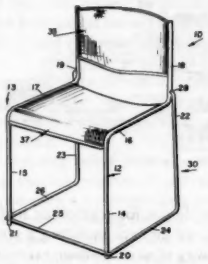
an integral rod including a pair of spaced parallel rear leg-

forming portions adjacent the ends thereof, and first, second, and third support portions between said rear leg-forming portions, said first and third support portions being generally parallel to each other and generally transverse to said rear leg-forming portions, and said second support portion being generally transverse to said first and third support portions, and disposed therebetween;

means defining a through-extending opening in each of said first and second tube front leg-forming portions through which a support portion of said integral rod passes;

a back operatively supported by said first and second tube back perimeter-forming portions;

a seat operatively supported by said first and second tube seat perimeter-forming portions;



means defining an opening in each of said first and second integral tubes for passage of an end of said integral rod into said respective tube; and

attachment means for affixing said integral rod to said first and second tubes at the openings in said tubes for receipt of said rod; and

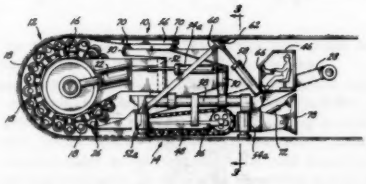
wherein operative attachment between said back and said first and second tube back perimeter-forming portions is provided in part by: a pair of plugs integral with said back, one extending outwardly from each side of said back; and means defining an opening in each of said first and second integral tube back perimeter-forming portions for receipt of a said plug.

4,548,442

MOBILE MINING MACHINE AND METHOD

David B. Sugden, Tasmania, Australia; Bruce A. Waddell, Seattle, Wash.; James P. Kindsvater, Everett, Wash., and Robert B. Moffat, Federal Way, Wash., assignors to The Robbins Company, Kent, Wash.

Filed Dec. 6, 1983, Ser. No. 558,784
Int. Cl.[4] E21C *41/00, 47/00*
U.S. Cl. 299—10 **45 Claims**



1. A method of cutting a tunnel in hard rock, comprising the steps of:

(a) providing a wheel-like cutterhead assembly means for cutting said hard rock, said cutterhead assembly means having a substantially horizontal axis of rotation and having multiple peripherally mounted rolling cutter units each rotatable about its own axis, said cutterhead assembly means being supported by boom means, said boom means being supported by frame means;

(b) anchoring said frame means within the interior of said tunnel;

(c) while rotating said cutterhead assembly means about its substantially horizontal axis, plunging said rotating cutterhead assembly means forwardly into the hard rock work face;

(d) while rotating said cutterhead assembly means about its substantially horizontal axis, sweeping said rotating cutterhead assembly across said hard rock work face, the rolling cutter units on the cutterhead assembly means being rotated about their respective axes by contact with the work face and making substantially helical cuts in the work face in the course of transiting the work face, such sweeping action and cutterhead assembly means rotation continuing until the cutterhead assembly means has transited completely across the work face;

(e) while rotating said cutterhead assembly means about its horizontal axis, plunging the rotating cutterhead assembly means forwardly into the hard rock work face;

(f) while rotating said cutterhead assembly means about its substantially horizontal axis, sweeping said rotating cutterhead assembly means back across the hard rock work face, such sweeping action and cutterhead assembly means rotation continuing until the rotating cutterhead assembly means has transited completely across the hard rock work face; and

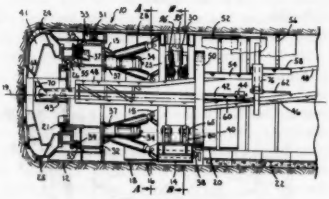
(g) repeating steps (c), (d), (e), and (f) above.

4,548,443

TUNNEL BORING MACHINE

John Turner, Renton, Wash., assignor to The Robbins Company, Kent, Wash.

Filed Jul. 3, 1984, Ser. No. 627,354
Int. Cl.[4] E21C *29/02*
U.S. Cl. 299—31 **6 Claims**



1. A tunnel boring machine comprising:

(a) a full face rotary cutterhead means;

(b) a cutterhead support means on which said cutterhead is mounted;

(c) gripper means carried by a gripper support frame means for reacting machine thrust, steering, and torque forces;

(d) a conveyor system for transporting muck from behind the cutterhead means to a dump point rearwardly of the machine;

(e) a primary propel system for advancing said cutterhead, said primary propel system being mounted between said gripper support frame means and said cutterhead support means, said primary propel system comprising a series of at least three pairs of double acting hydraulic propel cylinders arranged annularly in equally spaced apart locations and in a series of V-shaped configurations between said gripper support frame means and said cutterhead support means, each such pair of cylinders having an included angle between the cylinders of about 15° to 60° and with a line bisecting the included angle between the cylinders extending generally parallel to the longitudinal centerline of the machine;

(f) a hydraulic system delivering pressurized hydraulic fluid

to said pairs of double acting hydraulic propel cylinders and including multi-section positive displacement pump means with each pump section delivering high pressure fluid to an associated propel cylinder; and

(g) hydraulic system control means for controlling said pairs of hydraulic primary propel cylinders to effect (1) axial forward thrust on the cutterhead means by simultaneous delivery of an equal volume of hydraulic fluid to all the propel cylinders from the respective associated sections of said positive displacement pump means, the equal additional volume of fluid introduced to each cylinder thereby transmitting the reaction torque exerted on the cutterhead support means by rotation of the cutterhead means to said gripper support frame means by reason of the higher pressure generated in alternate propel cylinders and without roll of the cutterhead support means, (2) steering of the cutterhead support means and said cutterhead means by selective delivery of unequal volumes of hydraulic fluid to the propel cylinders at one side of the propel system, and (3) roll corrections of said cutterhead support means and said cutterhead means by selective delivery of unequal volumes of hydraulic fluid to alternate propel cylinders.

4,548,444

MINERAL WINNING PLOUGH

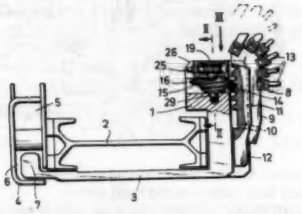
Oswald Breuer, Dortmund; Norbert Hesse, and Bernd Steinkuhl, both of Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Elsenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,508

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3222984

Int. Cl.⁴ E21C *27/32*

U.S. Cl. 299—34 **10 Claims**



1. A plough for winning material from a mineral face, the plough having a plough body, a carrier for roof-level cutters, and means for adjusting the vertical position of the carrier with respect to the plough body, the adjustment means comprising a worm mounted in a worm chamber formed in the plough body and a toothed rack associated with the carrier, the worm chamber being open on that side which faces the toothed rack thereby to accommodate the worm meshing with the toothed rack and being closed from above by a housing plate detachably secured to the housing, the worm being fixed to a worm shaft which protrudes upwardly through said housing plate into a reduction gear chamber formed between said housing plate and a detachable cover, said worm shaft being drivable through reduction gearing connected to said worm shaft and arranged in said reduction gear chamber, said reduction gearing having an input shaft which extends substantially at right-angles to the axis of the worm shaft, the free end of the input shaft being directed towards the goaf side of the carrier.

4,548,445

DEVICE FOR CONTROLLING HYDRAULIC PRESSURE FOR BRAKING A VEHICLE

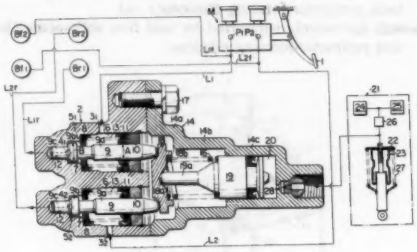
Mitutoyo Mizusawa, and Masao Fujisawa, both of Ueda, Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Aug. 18, 1983, Ser. No. 524,216

Claims priority, application Japan, Sep. 17, 1982, 57-161622; Sep. 17, 1982, 57-161623

Int. Cl.⁴ B60T *8/22*

U.S. Cl. 303—22 A **5 Claims**



1. In an improved device for controlling hydraulic pressure for braking a vehicle of the type including a pressure reducing valve disposed midway of an oil passage extending between an output port of a master cylinder and a rear wheel brake, said pressure reducing valve being adapted to proportionally reduce hydraulic pressure fed from the output port and then transmit reduced hydraulic pressure to the rear wheel brake, the improvement comprising a pneumatic spring incorporated in a suspension system for determining hydraulic pressure at which said pressure reducing valve initiates its pressure reducing function dependently on the weight of cargo loaded on the vehicle, said pneumatic spring being operatively connected to a valve body of said pressure reducing valve in such a manner as to bias said valve body in a valve opening direction and a mechanical spring externally positioned of the valve body and operatively connected to said valve body so as to bias the latter in a valve opening direction and serving to determine hydraulic pressure at which the pressure reducing valve initiates its pressure reducing function when the pneumatic spring falls into trouble.

4,548,446

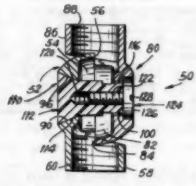
ARTICULABLE JOINT

Jerome Warshawsky, 3284 Bertha Dr., Baldwin Harbor, N.Y. 11510

Filed Oct. 15, 1982, Ser. No. 434,612

Int. Cl.⁴ H02G *13/00*

U.S. Cl. 339—2 A **8 Claims**



1. An articulable joint; comprising:

(a) a first joint half formed with a first contact surface;

(b) a second joint half formed with a second contact surface;

(c) said first contact surface and said second contact surface each being formed to be disposed one adjacent the other

and so that said first joint half and said second joint half may be rotatively disposed adjacent each other;

(d) a passageway extending through said first joint half and said second joint half;

(e) connecting pin means extending through said passageway;

(f) said connecting pin means including fastening means for securing said connecting pin means in position in said passageway, and said joint halves in rotative position with respect to each other;

(g) said first joint half and at least a first portion of said connecting pin means being respectively formed for frictional engagement with each other; and

(h) said second joint half and at least a second portion of said connecting pin means being formed for a sliding but non-rotative fit one with respect to the other;

(i) each of said joint halves having an internally threaded end piece, each of said end pieces being substantially concentric;

(j) said passageway being formed by providing a first opening through said first joint half and a second opening through said second joint half and so as to be aligned with said first opening;

(k) said first opening being formed with its entire surface tapered and said first portion of said connecting pin means being formed with a corresponding tapered surface; and

(l) said second opening being formed with its entire surface toothed and said second portion of said connecting pin means being formed with external teeth formed for mating engagement with said toothed inner surface to provide said sliding non-rotative fit.

4,548,447

ELECTRICAL JACK

Jeffrey P. Dinsmore, Excelsior, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Apr. 5, 1984, Ser. No. 597,244
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **13 Claims**

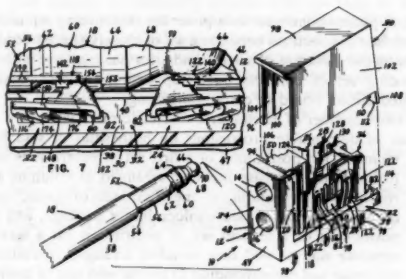


FIG. 7

1. An electrical jack for receiving electrical plugs, said jack for use on a circuit board, said jack comprising:

a non-conductive housing having a center plane and a bottom wall, said bottom wall being substantially parallel with said circuit board when said housing is attached to said circuit board, said center plane being substantially perpendicular to said bottom wall, said housing further having a plurality of means for receiving a plug, each of said receiving means having an axis substantially parallel to said bottom wall, said plurality of receiving means being stacked and having said axes in the center plane of said housing; and

spring means for providing continuity between conductive paths on said circuit board and said plugs; and

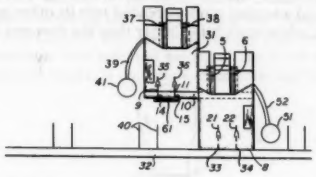
means for fastening said spring means to said housing.

4,548,448

BRIDGING CONNECTOR ASSEMBLY AND METHOD OF USING SAME

Edward Ellison, Oakland, N.J., and Otto R. Gruber, Wappingers Falls, N.Y., assignors to New York Telephone Company, New York, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,093
Int. Cl.[4] H01R *31/02*
U.S. Cl. 339—17 C **4 Claims**



1. A bridging connector assembly for use in changing the connection of multiple subscriber lines to a second main distributing frame from a first main distributing frame to which the multiple subscriber lines are connected by a plug connector, said bridging connector assembly being adapted to electrically connect with the plug connector, said bridging connector assembly comprising:

a connector body having first and second faces, said connector body including:

first and second rows of female sockets opening out of said first face, said female sockets being adapted for receiving and electrically connecting with connecting pins from the multiple subscriber lines; and

first and second rows of wire wrap terminals extending from said second face, each of said wire wrap terminals being electrically connected to a corresponding one of said female sockets, and said wire wrap terminals being adapted for receiving and electrically connecting with multiple wires from the second main distributing frame;

a printed circuit card having first and second rows of apertures, first and second rows of holes, and printed circuit electrically connecting each aperture of said first and second rows of apertures to a corresponding one of said first and second rows of holes, said printed circuit card being mounted to said second face of said connector body such that each of said wire wrap terminals extends through a corresponding one of said apertures and electrically connects with a corresponding printed circuit; and

first and second rows of connecting pins mounted to said printed circuit card such that each of said connecting pins extends through a corresponding one of said holes and electrically connects with a corresponding printed circuit, thereby electrically connecting each of said connecting pins to a corresponding one of said wire wrap terminals and to a corresponding one of said female sockets, said connecting pins being adapted for electrically connecting with female sockets of the plug connector from the first main distributing frame.

4,548,449

LAMP SOCKET ATTACHMENT

John A. Corsetti, 833 SW. Bayshore Blvd., Port St. Lucie, Fla. 33452

Filed Dec. 30, 1983, Ser. No. 567,186
Int. Cl.[4] H01R *13/02*
U.S. Cl. 339—154 L **8 Claims**

1. A lamp socket attachment to convert a conventional screw-type light bulb socket into a spring insert type socket which attachment comprises:

a hollow cylindrical member open at both ends made of electrically non-conductive material,

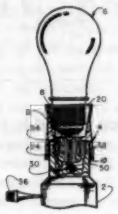
a transverse partition made of electrically non-conductive

material located approximately at the middle of said member dividing it into upper and lower cup-like compartments,

a cylindrical plug made of electrically non-conductive material fixed concentrically in said lower compartment, the length of said plug being slightly greater than the depth of said lower compartment,

a bore centrally through said plug and said partition,

a contact member made of electrically conductive material positioned in said bore, said contact member comprising a spiral spring, a first screw threaded into one end of said spring and a second screw threaded into its other end, the heads of said screws being larger than the diameter of said



bore whereby said contact member is captive within said bore, said contact member being adjustable in length by threading said screws inwardly or outwardly of said spring,

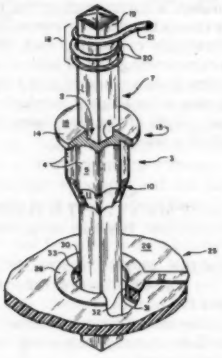
a first conductor member made of electrically conductive material having a lower portion extending along the outside of said plug through said partition and an upper portion extending along the inside surface of said upper compartment, said conductor member being structured so said lower portion will engage the threads of said screw-type light bulb socket when said plug is inserted into said socket and said upper portion will engage the threads of a conventional screw base light bulb inserted into said upper compartment of said lamp socket attachment.

4,548,450

TERMINAL PIN SECURING ARRANGEMENT

William A. Reimer, Wheaton, and David L. Vonder, Addison, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed May 29, 1984, Ser. No. 614,500
Int. Cl.[4] H01R *9/16*
U.S. Cl. 339—17 C **8 Claims**



1. An arrangement for securing a terminal pin to a printed wiring board comprising:

a printed wiring board;

an aperture formed in said printed wiring board;

a terminal pin of square cross-section;

a cylindrical collar of elastomeric material including a plurality of planar walls defining a central bore and an outer surface, said bore sized to rigidly engage said terminal pin, and said collar outer surface sized to tightly engage said aperture;

a plurality of cavities each defined by a circumferential wall between a pair of parallel opposite side walls and each formed at a corner defined by the intersection of a different adjacent pair of said planar walls;

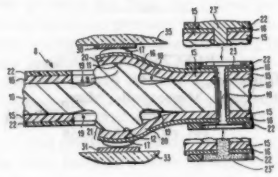
a plurality of projections formed on said terminal pin and positioned to engage said cavities, said terminal pin assembled within said central bore with said projections engaged with said corresponding cavities, and said collar and terminal pin assembly pressed into said aperture to compress said collar between said aperture and said terminal pin to thereby secure said pin to said board.

4,548,451

PINLESS CONNECTOR INTERPOSER AND METHOD FOR MAKING THE SAME

Garry M. Benarr, Wappingers Falls; Terry A. Burns, Poughkeepsie, and William J. Walker, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,701
Int. Cl.[4] H01R *23/72*
U.S. Cl. 339—17 M **27 Claims**



1. A pinless connector interposer for establishing a plurality of surface connections between a set of closely spaced contact pads on the substrate of a semiconductor package and a corresponding set of contacts on a supporting rigid or flexible printed circuit board or card, comprising;

a base member of elastomeric dielectric material,

sets of deformable protrusions on both sides of said base member, the positioning of a first set of protrusions on a first side of said base member arranged in columns and rows and corresponding to one of said sets of contact pads on said substrate of said semiconductor package, and the positioning of a second set of protrusions on a second opposite side of said base member arranged in columns and rows and corresponding to one of said sets of contact pads on said supporting printed circuit board or card,

a flexible overlay secured to each of said first and second sides of said base member,

a plurality of electrically conductive elements on each of said flexible overlays with end portions of each of said conductive tab elements located over one of said deformable protrusions, and the opposite end portion of each of said conductive tab elements terminating in spaced relation to the associated deformable protrusions,

a plurality of aligned openings through said base member, and each of said flexible overlays,

conductive means extending through said aligned openings in said base member and overlays for electrically connecting each opposite end of an electrically conductive tab element of an overlay on said first side of said base member to a corresponding electrically conductive tab element

of the overlay on said second opposite side of said base member.

4,548,452

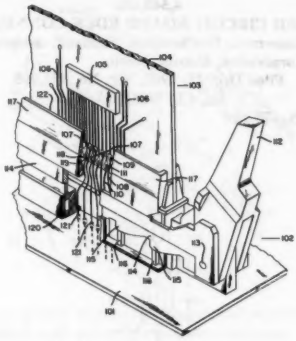
HIGH-DENSITY ELECTRICAL CONTACT PAD PATTERN

John B. Gillett, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,003

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 339—17 R **6 Claims**



1. A high-density electrical contact pad pattern positioned along at least one edge of a flat surface of an electronic component for connecting with a zero-insertion-force type connector, said connector including contact pins having corresponding contact regions each region disposed to contact and wipe one of said contact pads in a direction substantially perpendicular with said at least one edge of said electronic component during the actuation sequence of said connector, said contact pad pattern comprising:

a first row and a second row of electrically insulated contact pads, aligned substantially parallel with the edge of said flat surface, each one of said contact pads enclosing a substantially identical respective elliptical area of high probability of contact with a corresponding contact region, each contact pad oriented so that the major axis of the respective enclosed elliptical area is substantially parallel with the direction of wipe of the corresponding contact region;

wherein said second row of contact pads is offset with respect to and interleaved with said first row of contact pads, and wherein each enclosed elliptical area is spaced apart from adjacent enclosed elliptical areas within the same row a distance less than the length of the minor axis of each said elliptical area.

4,548,453

RIGHT ANGLE COAXIAL PLUG CONNECTOR

Dale B. Mummey, Camp Hill, and Alan E. Plotts, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 11, 1983, Ser. No. 474,413

Int. Cl.⁴ H05K *1/00*

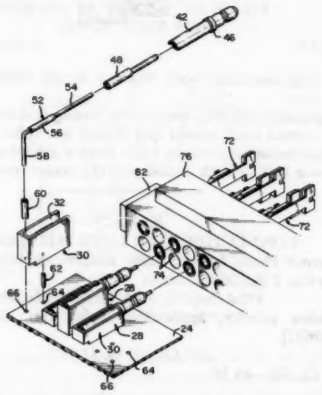
U.S. Cl. 339—17 C **9 Claims**

1. A right angle coaxial plug connector for mounting on a printed circuit board for electrical connection with signal and ground conductive paths thereon, comprising:

a conductive mounting member having a bottom surface, an upper surface, opposing sides, a front surface and a rear end, said bottom surface for mechanical engagement with the printed circuit board and for electrical connection with the ground conductive path thereon, a sleeve-receiving channel extending into said mounting member from said upper surface and rearwardly from said front surface thereof, said upper and bottom surfaces being substantially parallel, said mounting member having a hole adjacent said rear end thereof extending through said bottom surface, said hole being in communication with said sleeve-receiving channel and being substantially normal thereto;

dielectric means extending along said hole;

conductive sleeve member securable in said mounting member and having a first section and a second section and a bore therethrough, said first section extending from said second section to an inner sleeve end and along said sleeve-receiving channel and being mechanically secured in said channel with said inner sleeve end being disposed proximate said hole and having an undercut therein such that said bore is in communication with said hole, and said



second section of said conductive sleeve member extending outwardly from said front surface of said mounting member defining an outer contact member;

a dielectric sleeve disposed within said conductive sleeve member and extending from at least a front surface of said conductive sleeve member to a position adjacent said inner sleeve end; and

a center contact having a first section extending along said dielectric sleeve, a second section extending outwardly from said front surface of said conductive sleeve member defining a center contact member and a third section which extends outwardly from said inner end of said sleeve member, extends at a right angle through said undercut and extends along said dielectric means of said hole and extends beyond the section of said bottom surface at which said hole is located.

4,548,454

ELECTRICAL CONTACT FOR A VEHICLE STEERING DEVICE

Gregor Zeller, and Helmut Bonn, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Petri A.G., Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,297

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150427

Int. Cl.⁴ H01R *39/00*

U.S. Cl. 339—3 S **6 Claims**

1. An electrical contact for a vehicle steering device comprising:

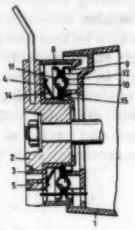
a steering column mounted in a stationary position to a vehicle chassis;

a steering wheel rotatably mounted to said steering column;

means for making an electrical connection between said

steering column and said steering wheel, said means including

a first contact track disposed in said steering column and a second contact track disposed in said steering wheel, said contact tracks forming roller body races;



at least one roller body disposed in said roller body races; and

a plurality of spring tongues for biasing said first and second contact track against said at least one roller body;

wherein said at least one roller body is guided approximately one half by each of said pair of contact tracks.

4,548,455

CONNECTOR WITH LOCK MECHANISM

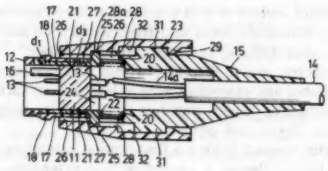
Tadayoshi Ezure, Isesaki, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Oct. 15, 1984, Ser. No. 660,680

Claims priority, application Japan, Oct. 24, 1983, 58-164196[U]

Int. Cl.⁴ H01R *13/629*

U.S. Cl. 339—45 M **12 Claims**



1. A connector with a lock mechanism, comprising:

(a) a plug body of an insulating material;

(b) at least one plug contact mounted on said plug body;

(c) a cap mounted on a rear portion of said plug body;

(d) a coupling sleeve disposed coaxially around said cap and said plug body and axially movable;

(e) at least one locking spring supported on said plug body and projecting forwardly thereof, said locking spring having on a front end thereof a protrusion projecting radially outwardly or inwardly with respect to an axis of said plug body, said locking spring being resiliently displaceable in a direction opposite to the direction in which said protrusion projects;

(f) at least one support bar held against said locking spring on a side opposite from said protrusion and axially movable;

(g) an engagement member connected to a rear end of said support bar and axially engaging said coupling sleeve, said engagement member being axially movable;

(h) a coil spring for normally urging said engagement member and said coupling sleeve in a forward direction;

(i) a socket body of an insulating material;

(j) at least one socket contact mounted on said socket body and electrically connectable to said plug contact;

(k) said socket body having an insertion slot defined in a front surface thereof for receiving said locking spring and said support bar, said insertion slot having a width smaller than the sum of the thickness of said locking spring including said protrusion and the thickness of said support bar and larger than the sum of the thickness of said locking spring other than said protrusion and the thickness of said support bar; and

(l) said socket body having a recess defined in said insertion slot and axially engageable with said protrusion when said locking spring and said support bar are inserted into said insertion slot.

4,548,456

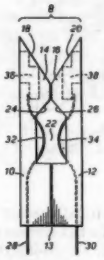
PRINTED CIRCUIT BOARD EDGE CONNECTORS

John A. Robertson, Dunfermline, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1982, Ser. No. 451,905

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 339—75 MP **10 Claims**



1. A system wherein a connector provides electrical connection to an edge of a printed-circuit board, said connector comprising

first and second opposed lever arms, means for pivotably coupling said first and second lever arms to each other, said first and second lever arms respectively including first and second opposed protrusions remote from said coupling means, and first and second opposed spring contacts respectively coupled to said first and second lever arms for urging said first and second lever arms towards each other,

wherein said connector further includes a base, said second lever arm inflexibly affixed to said base, said pivotable coupling means connected between said second lever arm and said first lever arm, whereby said first lever arm may pivot about said second lever arm, and

wherein said second lever arm is longer than said first lever arm and said first lever arm is pivotably coupled to said second lever arm so that the basal end of said first lever arm is a short distance clear of the base to allow the first lever arm to be free to pivot relative to the second lever arm; and said printed-circuit board comprising

first and second contact pads on opposite sides thereof proximate to said edge and a void, where

said edge is insertable between said opposed protrusions for the separation thereof to move said opposed lever arms and said opposed spring contacts apart, wherein

said printed-circuit board is insertable a predetermined distance between said protrusions without said first and second spring contacts engaging said first and second pads, and wherein

when said printed-circuit board is inserted said predetermined distance said protrusions engage said void in said printed-circuit board to allow the restoration of the unseparated positions of said opposed lever arms for said first and second spring contacts, in the coming-together

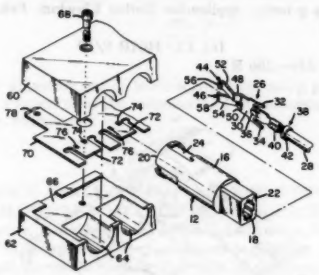
thereof, to engage respectively said first and second contact pads.

4,548,457

ZERO MATING FORCE TERMINAL HAVING WIPING ACTION

Paul B. Derr, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 30, 1984, Ser. No. 605,511
Int. Cl.⁴ H01R *13/11*
U.S. Cl. 339—88 R **14 Claims**



1. A pair of zero mating force electrical terminals having a wiping action, said pair of terminals comprising:

a first terminal having a planar blade portion with oppositely directed embossments uniformly spaced from a free end of said blade portion; and

a second terminal formed with a planar body having integral conductor engaging means at one end thereof and mating means at the opposite end thereof, said mating means comprising a pair of cantilever beam arms,

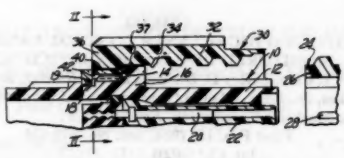
said terminals being initially mated with their planes normal to each other and then being relatively rotated about their longitudinal axes to bring the free ends of said arms into engagement with said embossments under load, the second terminal then being released whereby the arms thereof drive towards a normal relaxed condition effecting a wiping action on said embossments.

4,548,458

ELECTRICAL CONNECTOR HAVING A MOLDED ANTI-DECOUPLING MECHANISM

David O. Gallusser, Oneonta, and David L. Frear, Bainbridge, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 2, 1984, Ser. No. 637,184
Int. Cl.⁴ H01R *13/623*
U.S. Cl. 339—89 R **3 Claims**



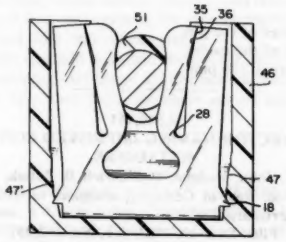
1. An electrical connector of the type comprising a cylindrical shell having a plurality of ratchet teeth projecting radially outward from the outer periphery thereof, a cylindrical coupling nut molded from a plastic material rotatably captivated to said shell for connecting to a complementary connector shell, a spring beam integrally molded to said nut and having a tooth directed radially inward to engage successive of said ratchet teeth for resisting rotation of the coupling nut relative to said shell, and captivating means for captivating said coupling nut on said shell, characterized by said spring beam having one end portion integrally molded into the coupling nut and the other end portion free to flex radially inward and outward relative to the one end portion, the one end portion of said beam comprising a flange for simultaneously axially positioning the coupling nut about the shell and radially positioning the tooth relative to the ratchet teeth.

4,548,459

ELECTRICAL TERMINAL FOR WIRES OF DIFFERENT GAUGES

Mosser, III: Benjamin H., Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1984, Ser. No. 646,653
Int. Cl.⁴ H01R *9/08*
U.S. Cl. 339—97 P **6 Claims**



1. A one-piece electrical terminal for wires of different gauges which terminal is stamped and formed from sheet metal and comprises a plate portion including a pair of inner resilient limbs arranged side-by-side in spaced apart relation with opposed edges defining between them a wire receiving slot and a pair of outer resilient limbs arranged on respective opposite sides of and spaced from the pair of inner limbs, all the limbs being coplanar whereby insulated wire can be forced perpendicularly of its axis into a mouth of the wire receiving slot so that the edges of the inner limbs penetrate the insulation and establish permanent connection to the wire core with deformation of the inner limbs towards the outer limbs, insertion of a small wire causing resilient deformation of only the inner limbs which remain spaced from the outer limbs whereas insertion of a large insulated wire deforming the inner limbs outwardly so that their outer edges engage the outer limbs producing resilient deformation thereof.

4,548,460

ANTI-SLIP FIXING DEVICE FOR RIBBON-TYPE STRAPS AND CABLES

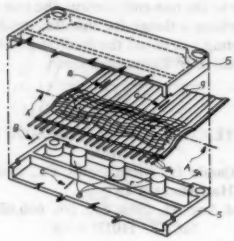
László Dózsa; Jeno Pelencei, and Gyula Somodi, all of Budapest, Hungary, assignors to Telefongyar, Budapest, Hungary

PCT No. PCT/HU81/00029, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO82/00384, PCT Pub. Date Feb. 4, 1982
Continuation of Ser. No. 354,093, Jan. 26, 1982, abandoned. This PCT application Jul. 3, 1981, Ser. No. 604,430
Claims priority, application Hungary, Jul. 12, 1980, 1753/80
Int. Cl.⁴ H01R *13/58*
U.S. Cl. 339—107 **11 Claims**

1. Anti-slip clamping device for fixing a ribbon-type cable against slipping, comprising two half pieces, fixing pins formed at least in one half piece, at least one fixing chamber formed in at least one of said half pieces for mating with the pins of the other half piece, wherein said pins have a height providing a positive three dimensional locking action on said cable without said pins penetrating into said cable, thereby eliminating the

need for locking holes and a fastening means securing the two half pieces together when clamped, said pins and holes being dimensioned according to the following relations:

$d > b/8n$



wherein

d—diameter of the pin;

b—width of the cable;

n—number of the pins.

4,548,461

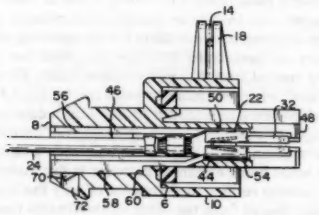
CONNECTOR HAVING IMPROVED CONTACT RETAINERS

Heinrich R. John, Rodgau, and Ulrich B. Münk, Darmstadt, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 19, 1983, Ser. No. 562,937

Int. Cl.[4] H01R 4/24

U.S. Cl. 339—217 R **4 Claims**



1. An electrical connector of the type comprising an insulating housing having a mating face and a rear face which is directed oppositely with respect to the mating face, a plurality of contact-receiving cavities extending through the housing from the rear face to the mating face, the cavities being in side-by-side parallel relationship in a row, a contact terminal in each cavity, each terminal having a contact portion which is proximate to the mating face and having a crimp portion which is crimped onto a wire, the crimp portion being between the mating face and the rear face, the wire extending from the crimp portion through the cavity and beyond the rear face, the connector being characterized in that:

each of the cavities has a cavity floor, the housing having a recess extending therein from the rear face towards the mating face, the recess intersecting the cavity floors, the recess having an inner end and having a shoulder at the inner end which is directed towards the rear face,

a terminal retainer inserted through the rear end of the recess is provided in the housing, the terminal retainer having a common support which extends from the rear end of the housing to the shoulder and which fills the recess, the common support having a plurality of fingers extending therefrom, each of the fingers extending into one of the cavities and having a free end which is against the terminal in the one cavity, each finger being supported by the cavity floor against deflection whereby, the terminals are retained by the fingers in their respectve cavities, and the terminals cannot be inserted into, or removed from, the cavities when the terminal retainer is assembled to the housing.

4,548,462

CABLE CLAMPING DEVICE

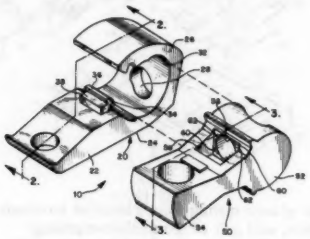
Paul A. Cornell, Knockanore, Ireland, assignor to Pan Electric Corporation, Carson City, Nev.

Filed Jan. 10, 1984, Ser. No. 569,664

Claims priority, application United Kingdom, Feb. 11, 1983, 8303790

Int. Cl.[4] H01R 9/10

U.S. Cl. 339—266 R **8 Claims**



1. A device for clamping a cable comprising:

first and second clamping members mounted together for pivotal movement about an axis, said clamping members defining two pairs of opposed clamping surfaces and pivotable between an open position, in which a free end of a cable is insertable into the device, and a closed position, in which the cable is clamped between the two pairs of clamping surfaces;

the one of the clamping surfaces nearest the free end of the cable being disposed on the first clamping member and shaped to promote lateral spreading of the cable when the device is closed;

the second clamping member defining a window aligned with said one of the clamping surfaces and a cable receiving opening adjacent to the window such that the cable extends through the cable-receiving opening into the window;

the window having a width measured along a direction parallel to the axis greater than that of the opening such that said one of the clamping surfaces operates, when the device is closed, to spread the free end of the cable laterally to a width greater than that of the opening, thereby increasing pull-out resistance of the device.

4,548,463

HOLOGRAPHIC SCANNER CONTROL BASED ON MONITORED DIFFRACTION EFFICIENCY

Robert T. Cato; LeRoy D. Dickson, both of Raleigh, and Olen L. Stokes, Jr., Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,635

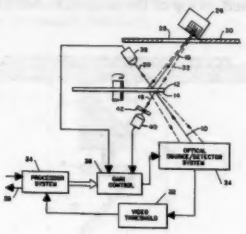
Int. Cl.[4] G02B 5/32, 27/17

U.S. Cl. 350—3.71 **14 Claims**

1. In an optical scanner of the type having a coherent light source and a rotating beam-deflecting component with a plurality of contiguous holographic optical elements for deflecting the coherent light beam along predetermined scan lines, scanner controller means comprising:

means for monitoring the diffraction efficiency of the holo-

graphic optical element in the region currently aligned with the coherent light beam produced by the source; and



means for adjusting one or more scanner operating parameters as a function of the magnitude of the monitored diffraction efficiency.

4,548,464

FREQUENCY ANALYZER IN PLANAR WAVEGUIDE TECHNOLOGY AND METHOD OF MANUFACTURE

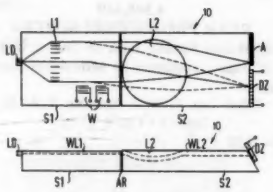
Franz Auracher, Baierbrunn, and Michael Stockmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,625

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138727

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 350—96.14 **15 Claims**



1. An acousto-optical frequency analyzer constructed to minimize manufacturing cost wherein the analyzer includes a first part comprising a first substrate of a first material, a first waveguide of the first substrate, and a means for modulating light traveling in the first waveguide; a second part comprising a second substrate of a second material, a second waveguide on the second substrate, a geodesic lens being formed in said second substrate and the second material being a material selected from the group consisting of glass and synthetic plastics; and the first and second parts being optically coupled with light passing from the first waveguide into the second waveguide.

4,548,465

PANEL SEAL AND SUPPORT STRUCTURE FOR FIBER OPTIC CABLE

Allan E. White, Hightstown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 11, 1983, Ser. No. 540,759

Int. Cl.⁴ G02B *7/26*

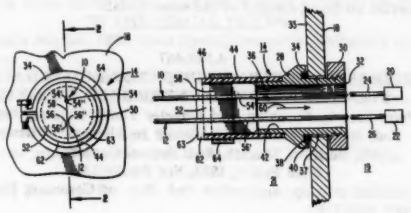
U.S. Cl. 350—96.20 **8 Claims**

5. A panel seal and support structure for a fiber optic cable passing through an opening in said panel comprising:

a hollow member having a threaded exterior surface at one end adapted to pass through said opening, and a cylindrical sleeve portion at a second end opposite the one end, said member having an annular portion between said ends of greater diameter than said threaded exterior surface forming a shoulder which is adapted to abut a surface of said panel when said threaded surface passes through said opening;

an elastomeric sleeve secured to said sleeve portion of said member;

first and second elastomeric members closely received within said elastomeric sleeve, said elastomeric members



abutting along facing surfaces thereof, said facing surfaces forming at least one opening for closely receiving a portion of said fiber optic cable; and

clamp means engaged with said elastomeric sleeve for resiliently clamping said sleeve against said elastomeric members and said elastomeric members against said received cable.

4,548,466

OPTICAL FIBRE COUPLING ASSEMBLIES

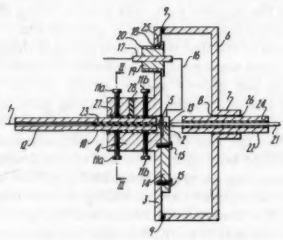
Dain S. Evans, 4 Upper Sales, Chaulden, Hemel Hempstead, Hertfordshire, England; George A. Georgiou, 45 Oakwood Ave., London, England (N.14); Peter Mossman, 'Thistles', Cokes La., Chalfont St.Giles, Buckinghamshire, England; Arabinda Mukherjee, 11 Culver Grove, Stanmore, Middlesex, England, and John B. Whiscombe, 19 Sutherland Rd., Ealing, London, England (W.13)

Filed Sep. 29, 1983, Ser. No. 536,997

Claims priority, application United Kingdom, Sep. 29, 1982, 8227799

Int. Cl.⁴ G02B *7/26*

U.S. Cl. 350—96.20 **20 Claims**



1. An optical assembly comprising a metal housing forming an enclosure and having a front wall provided with an aperture and an intergral external boss formed around the aperture, which boss has a central bore extending from the said aperture orthogonally to the front wall, an opto-electronic device located within the housing adjacent to the centre of the said aperture, mounted on a metal header attached to the interior surface of the front wall, and connected to an electrically conducting lead which is extended through the housing wall by means of a glass-to-metal seal, a metal ferrule inserted coaxially within the bore of the boss, an optical fibre located along the axis of the ferrule, with the end of the fibre in contact with the said device, and two sets of screws inserted through the wall of the boss at two locations spaced apart longitudinally

with respect to the boss, for adjusting the radial and angular position of the ferrule within the boss to align the optical fibre with the said device, and for clamping the ferrule in position, each said set consisting of at least three screws spaced apart around the circumference of the boss, the ferrule being soldered to the interior surface of the boss wall, the optical fibre being hermetically sealed into the ferrule, and at least the front wall of the housing, the device supporting header and the ferrule all being formed of the same metal.

4,548,467

RELEASABLE OPTICAL FIBER CONNECTOR HAVING FLEXIBLE WEBS AND UNDERSIZED GROOVES

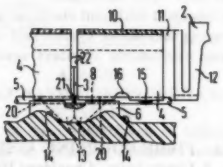
Peter Stoerk, Poecking, and Günter Thom, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,805

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203929

Int. Cl.[4] G02B *7/26*

U.S. Cl. 350—96.21 **16 Claims**



1. In a coupling device for releasably coupling a first fiber optical waveguide to a second fiber optical waveguide with an end-to-end alignment, said device including a first coupling part having a seating surface with a longitudinally extending channel and a second coupling part supporting an end of the first waveguide and being coupled to the first part with the end of the first waveguide being received in the channel and aligned with the end of the second waveguide to couple the two waveguides together, the improvements comprising said second coupling part having a support part with a longitudinally extending groove facing the seating surface, the end of the first waveguide being received in said groove and being secured to the support part, said groove being dimensioned so that, when the first waveguide is received therein, at least half the thickness of the first waveguide projects therefrom, and the end of the first waveguide immediately adjacent its end face is engaged by the groove and a portion of the longitudinally extending channel of the first coupling part; and means for mounting the support part in the second part for movement transverse to the axis of the first waveguide and to press the end of the first waveguide into said channel when the second and first coupling parts are assembled together, said means for mounting the support part including at least one flexible web extending in a longitudinal direction of the groove and having a flexural axis which is disposed parallel to an end of the first fiber optical waveguide received in the groove so that the support part is resiliently deflectable relative to the second part.

4,548,468

LOAD-BEARING REAR-PROJECTION SCREEN

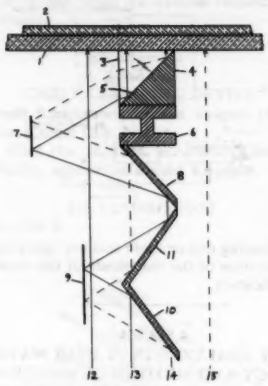
Dennis R. Anthony, 3119 Kelton Ave., Los Angeles, Calif. 90034

Filed May 17, 1984, Ser. No. 611,316

Int. Cl.[4] G03B *21/56*

U.S. Cl. 350—117 **1 Claim**

1. A load-bearing rear-projection screen, which load-bearing rear-projection screen comprises a rigid sheet of transparent material upon which a semitransparent light-scattering surface is established and which is supported on one or more pseudotransparent supports, each of which pseudotransparent supports comprises a suitable load-bearing structural member; a mirror mounted on top of the said structural member; a flat-topped block of transparent material, which block fits over the mirror mounted on top of the structural member and is bonded



to it; a mirror mounted on the underside of the structural member; and a flat mirror so mounted alongside the structural member that it receives light reflected from the mirror mounted on the underside of the structural member and reflects it to the mirror mounted on top of the stuctural member.

4,548,469

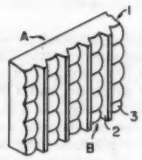
REAR PROJECTION SCREEN

Masao Inoue; Shingo Suzuki, both of Tokyo, and Syozo Saito, Ageo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,160

Int. Cl.[4] G03B *21/60*

U.S. Cl. 350—128 **3 Claims**



1. A rear projection screen having a viewer's side and a projection side, said rear projection screen comprising: a lenticular lens formed on said viewer's side and including a multiplicity of vertically extending lens units, said lenticular lens is constituted by lens units provided with total reflection surfaces and lens units having no total reflection surfaces, and refraction elements for vertically diffusing the light are formed on the lens units having no total reflection surfaces.

4,548,470

PROJECTION SCREEN

Jonathan Erland, Los Angeles, Calif., assignor to Apogee, Inc., Van Nuys, Calif.

Filed Jun. 11, 1984, Ser. No. 618,999

Int. Cl.[4] G03B *21/60*

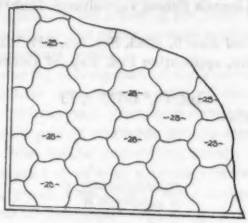
U.S. Cl. 350—129 **11 Claims**

1. An improved projection screen, comprising:

a substrate backing;

a plurality of tiles comprised of a screen material attached to

said backing, each of said tiles shaped in the general form of a regular concave hexagon having connective line segments between segment points defining said hexagon, the shape of each of said connective line segments being defined by a sinusoidal function;



said plurality of tiles being attached to said substrate backing in a regular periodic fashion, such that said backing is tessellated with said tiles;

whereby the edges of each of said tiles are not readily descerned by a viewer observing a projected image on said screen.

4,548,471

ADJUSTING DEVICE FOR LENSES

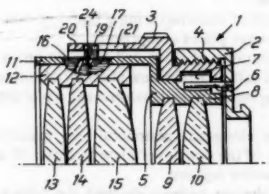
Werner Schlapp, Asslar, and Herbert Mulch, Lahnau, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,534

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 8220039[U]

Int. Cl.⁴ G02B 7/04

U.S. Cl. 350—255 **6 Claims**



1. An adjusting device for a lens system having at least two optical elements displaceable parallel to the optical axis, wherein the displacement paths of the optical elements are subject to interdependent but different courses of movement, comprising:

a first optical element;

a second optical element arranged along a common optical axis with said first optical element;

a rotatable adjusting ring surrounding said optical elements and being movable parallel to said optical axis, for focusing the lens system, wherein rotation of said adjusting ring displaces the ring along said optical axis;

a tubular member positioned within said adjusting ring, said tubular member comprising near one end a mount for said first optical element and including near its opposite end a guide groove in its wall, wherein said adjusting ring is rotatable with respect to the tubular member, wherein the adjusting ring and the tubular member define a fixed relative position along the optical axis, and wherein the tubular member is displaced only axially;

a hollow cylindrical member displaceably mounted within said tubular member, said cylindrical member comprising a mount for said second optical element;

a guide element mounted on the external surface of said cylindrical member for engagement with said guide groove and for guiding the cylindrical member in both an axial and a radial displacement; and

means for drivingly connecting said adjusting ring with said cylindrical member.

4,548,472

PLATE FOR REMOVING SURFACE REFLECTION OUT OF THE VISUAL FIELDS

Masataka Negishi, 1000, Oaza Ryoke, Urawa-Shi, Saitama-Ken, Japan

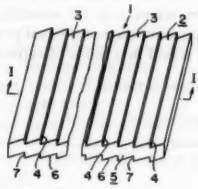
PCT No. PCT/JP82/00103, § 371 Date Nov. 16, 1982, § 102(e) Date Nov. 16, 1982, PCT Pub. No. WO82/03465, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 5, 1982, Ser. No. 444,393

Claims priority, application Japan, Apr. 6, 1981, 56-50625

Int. Cl.⁴ G02B 3/08

U.S. Cl. 350—276 R **9 Claims**



1. A plate for removing glare due to reflected rays from surfaces of objects, comprising:

at least one transparent plate having a thickness, a central longitudinal axis through a cross-section of the thickness, a front face, and a back face;

each of the front and back faces having a wave-like surface with a plurality of parallel sloped surfaces inclined in the same direction at an acute angle to the central longitudinal axis;

each of the plurality of parallel sloped surfaces having a sharp high edge and a sharp low corner extending in a direction of the thickness of the plate;

each of the front and back faces also having a plurality of parallel supplementary surfaces extending substantially perpendicularly to the central longitudinal axis of the plate in order to form the sharp low corner with an adjacent parallel sloped surface;

said sloped surfaces on the front face and said sloped surfaces on the back face being in such parallel relationship that each high edge and each low corner on the front face extend along a single line perpendicular to the central longitudinal axis as a low corner and a high edge, respectively, on the back face;

whereby a plurality of aligned parallelograms are formed by the pluralities of parallel sloped surfaces and parallel supplementary surfaces along the central longitudinal axis so that neither image coloring nor image shifting occurs and any image behind the plate can be seen clearly.

4,548,473

OPTICAL FILTER

Sau K. Lo, Fridley, and Ronald E. Peterson, Shoreview, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 12, 1983, Ser. No. 493,850

Int. Cl.⁴ G02B 5/20

U.S. Cl. 350—311 **5 Claims**

1. An electromagnetic energy filter comprising:

a first substance which is substantially transparent to electromagnetic energy within a selected first frequency range and having a first index of refraction;

a second substance having at least one resonance frequency

within said first frequency range and having a second index of refraction which is substantially the same as said first index of refraction at all of the frequencies within said first frequency range except for frequencies near said resonance frequency, wherein said second substance is

comprised of particles located, at least in part, within said first substance; and

wherein said particles have a maximum dimension of approximately $\lambda/2n$, where λ is the wavelength of light in said first substance with frequency equal to said resonance frequency and n is said first index of refraction.

4,548,474

INFORMATION HOLDING DEVICE

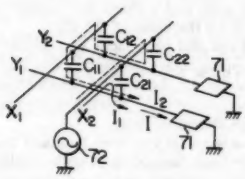
Yoshiharu Nagae, Hitachi, and Hideaki Kawakami, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,900

Claims priority, application Japan, Aug. 23, 1982, 57-144713

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—333 **20 Claims**



13. An information holding device comprising:

a dielectric material disposed between a pair of substrates having first and second electrodes formed on opposite surfaces thereof, respectively, said dielectric material exhibiting a non-write state in which said dielectric material has a first capacitance and a write state in which said dielectric material has a second capacitance changed from said first capacitance by the application of information thereto and held for a predetermined time after the removal of said information therefrom;

information write means for applying said information to said dielectric material to change said dielectric material from said non-write state to said write state; and

state detection means operably connected with said first and second electrodes for deriving an electric signal which has a level corresponding to the capacitance of a portion of said dielectric material between said first and second electrodes and indicative of whether the dielectric material portion is at said non-write state or said write state.

4,548,475

LIQUID CRYSTAL DISPLAY DEVICE WITH PARTIAL VACUUM IN PASSIVE REGIONS AND METHOD FOR MANUFACTURING SAME

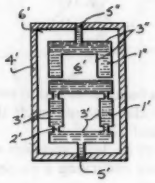
Konrad Brendle, Dornstadt; Harald Schiffer, Kirchberg, and Kurt Fahrenschon, Pfaffenhofen, all of Fed. Rep. of Germany, assignors to Licentia Patent Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,762

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245932

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—334 **15 Claims**



1. A liquid crystal display device comprising:

a first cover plate;

a plurality of elongated dams disposed on said first cover plate and arranged in a pattern to define a plurality of active electrically controllable regions on one side of each dam, and a plurality of passive regions on an opposite side of each dam all containing a partial vacuum;

liquid crystal material filling each of said active regions;

a second cover plate overlying and covering all of said active and passive regions, and connected to said first cover plate through said dams, said dams holding said first and second cover plates at a fixed spacing with respect to each other.

12. A method of manufacturing a liquid crystal device having a pair of cover plates comprising:

forming a plurality of elongated dams on one of said cover plates in a pattern to define a plurality of active regions for containing liquid crystal material and a plurality of passive regions;

applying an elongated peripheral seal material around a periphery of the one cover plate to close off at least some of said passive regions;

positioning the one cover plate with the dams and seal in a partial vacuum environment;

applying the other cover plate over the one cover plate and onto and into sealing connection with the dams and the seal to establish a partial vacuum in each of the passive regions;

providing at least one filling port through the seal and into communication with at least one of the active regions; and

filling the active region through the filling port with liquid crystal material.

4,548,476

TIME-SHARING DRIVING METHOD FOR FERROELECTRIC LIQUID CRYSTAL DISPLAY

Syuzo Kaneko, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,500

Claims priority, application Japan, Jan. 14, 1983, 58-5052

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 S **46 Claims**

1. In a time-sharing driving method for a device comprising an electrode matrix which comprises a pair of electrode groups oppositely spaced from each other, each comprising a plurality of electrodes, said pair of electrode groups intersecting with

each other to form matrix intersecting points, one electrode group being assigned to serve as scanning electrodes,

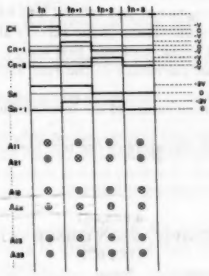
a scanning electrode being addressed and subject to application of voltage in a time-sharing manner,

the improvement wherein

the direction of the voltage applied to a selected matrix intersecting point in the scanning electrode addressed at a time is opposite to that of the voltage applied to the other matrix intersecting points.

4. In a time-sharing driving method for a device comprising an electrode matrix comprising a pair of electrode groups oppositely spaced from each other, each comprising a plurality of electrodes, said pair of electrode groups intersecting with each other to form matrix intersecting points, one electrode group being assigned to serve as scanning electrodes while the other electrode group is assigned to serve as signal electrodes, a scanning electrode being addressed and subject to application of voltage in a time-sharing manner, the improvement wherein the voltages applied to said scanning electrodes and said signal electrodes are in such amounts that the polarity of voltage value D_2–D_4 is different from that of the other voltage values D_2–D_3, D_1–D_4 and D_1–D_3,

wherein D_4 is a voltage applied to an addressed scanning



electrode, D_3 is a voltage applied to a non-addressed scanning electrode, D_2 is a voltage applied to a signal electrode selected from the plurality of signal electrodes, and D_1 is a voltage applied to the other signal electrodes.

7. In a time-sharing method for a device comprising an electrode matrix which comprises a pair of electrode groups oppositely spaced from each other, each comprising a plurality of electrodes, said pair of electrode groups intersecting with each other to form matrix intersecting points, one electrode group being assigned to serve as scanning electrodes while the other electrode group is assigned to serve as signal electrodes, a scanning electrode being addressed and subject to application of voltage in a time-sharing manner, the improvement wherein the voltages applied to said scanning electrodes and said signal electrodes are in such amounts that the following conditions are satisfied:

$$b_3 < b_2 < b_4 < b_1$$

wherein b_4 is a voltage applied to an addressed scanning electrode, b_3 is a voltage applied to a non-addressed scanning electrode, b_2 is a voltage applied to a signal electrode selected from the plurality of signal electrodes and b_1 is a voltage applied to the other signal electrodes.

4,548,477

LIGHT MODULATING APPARATUS

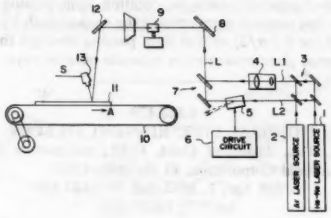
Toshitaka Agano, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 18, 1982, Ser. No. 379,352

Claims priority, application Japan, May 22, 1981, 56-78332

Int. Cl.⁴ G02F 1/11

U.S. Cl. 350—358 **9 Claims**



1. A method of reading out an image by a scanning light beam comprising the following steps:

combining light beams of different wavelengths into a first coaxial sharp light beam;

combining said light beams of said different wavelengths into a second coaxial sharp light beam;

expanding one of said coaxial sharp light beams into an unsharp beam;

passing one of the sharp beam and the unsharp beam into a single light modulator to modulate the beam at a predetermined frequency;

providing a zero-order diffracted modulated light beam from the light beam that is modulated by the modulator;

combining the modulated light beam with the unmodulated light beam to provide a scanning beam; and

directing the scanning beam onto a moving original; and

sensing the light reflected from said moving original.

4,548,478

OPTICAL DEVICE

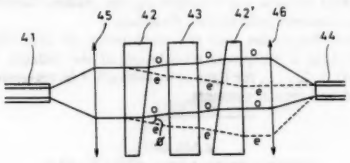
Masataka Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 11, 1981, Ser. No. 329,940

Claims priority, application Japan, Dec. 15, 1980, 55-176687

Int. Cl.⁴ G02F 1/29

U.S. Cl. 350—377 **8 Claims**



1. An optical device for optically coupling first and second optical fibers, each optical fiber having an excitation end and a core diameter a, via an optical path between the first and second optical fibers, comprising:

first and second lenses, located in the optical path, each lens having a focal length f and being positioned so that the focal positions of the first and second lenses are respectively located at the excitation ends of the first and second optical fibers and so that the first and second lenses collimate the light emitted from the first and second optical fibers into parallel rays;

first and second tapered plates of birefringent material interposed between the first and second lenses to double re-

fract light of different polarizations so that an angle of separation between ordinary and extraordinary rays is ϕ and the relationship $\tan \phi > a/f$ is satisfied, the first and second tapered plates each having an optical axis, the optical axis of the first tapered plate being rotated by an angle of θ (or $\theta+\pi/2$) with respect to the optical axis of the second tapered plate;

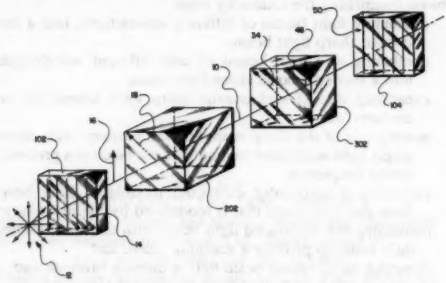
an element for changing the plane of polarization of light passing therethrough interposed between the first and second tapered plates for rotating light passing through the first tapered plate around the optical path by an angle of θ (or $\theta+\pi/2$) so that light passing through the second tapered plate emanates as separate parallel rays.

4,548,479

ISOPHASE BIREFRINGENT FILTERS

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1983, Ser. No. 481,438
Int. Cl.[4] G02F *1/23*
U.S. Cl. 350—404 **26 Claims**



1. An optical filter, comprising:

a first polarizer for transmitting light having a first polarization direction;

a first birefringent element, with a birefringence Δn_1, for receiving the light transmitted by said first polarizer;

a second birefringent element, with a birefringence Δn_2, different from Δn_1, for receiving the light transmitted by said first element; and

a second polarizer for receiving the light tranmitted by said second element and transmitting the portion thereof having a second polarization direction,

said birefringences and the thicknesses of said elements effecting a net phase retardation of $n\pi$ radians, where $n=0, 1, 2, \ldots$, for light of wavelength λ in traversing said first and second elements.

4,548,480

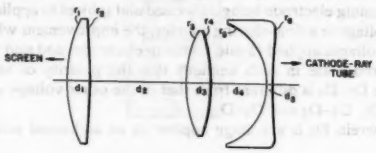
PROJECTION LENS APPARATUS

Yoshiharu Yamamoto, Toyonaka; Yasuo Nakajima, Ibaraki, and Yoshitomi Nagaoka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 19, 1983, Ser. No. 459,242
Claims priority, application Japan, Jan. 20, 1982, 57-8113
Int. Cl.[4] G02B *3/04, 9/12*
U.S. Cl. 350—432 **9 Claims**

1. A projection lens apparatus provided with a projection lens system which is used for a projection display apparatus for television pictures and which comprises: a first, second and third lens, said first lens being a double-convex positive lens with one convex surface of a larger curvature facing toward a screen and having at least one aspherical surface; said second lens being a double-convex positive lens and having one convex surface of a larger curvature facing toward said screen and disposed behind said first lens; and said third lens being a negative lens having one concave surface of a larger curvature facing toward said screen, and having a bi-aspherical surface and being disposed behind said second lens, said first, second and third lenses being arranged in the order from the screen side, said first lens being a plastic lens, said second lens being a glass lens, and said third lens being a plastic lens, said projection lens apparatus satisfying the following conditions:

(1) $0.4|\gamma_4| < \gamma_3 < 0.75|\gamma_4$
(2) $0.5 < f/f_1 < 0.8$
(3) $0.8 < f/f_2 < 1.0$
(4) $-1.2 < f/f_3 < -0.9$
(5) $1.3 < f_1/f_2 < 1.8$
(6) $0.35f < d4 < 0.55f$ and
(7) $4\gamma_1 < |\gamma_2|$



where

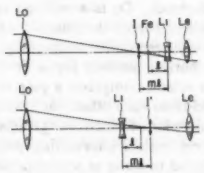
f: the focal length of said projection lens system,
f_1: the focal length of said first lens,
f_2: the focal length of said second lens,
f_3: the focal length of said third lens,
d_4: the distance between said second lens and said third lens,
γ_1: the radius of curvature of the surface at the screen side, i.e., the front surface, of said first lens,
γ_2: the radius of curvature of the rear surface of said first lens,
γ_3: the radius of curvature of the front surface of said second lens, and
γ_4: the radius of curvature of the rear surface of said second lens.

4,548,481

VARIABLE MAGNIFICATION OBSERVATION OPTICAL DEVICE

Kenji Yamada, Narashino, Japan, assignor to Nippon Kogaku K.K., Japan

Filed Nov. 7, 1983, Ser. No. 549,325
Int. Cl.[4] G02B *7/04, 21/00, 23/00*
U.S. Cl. 350—559 **8 Claims**



1. A variable magnification observation optical device comprising:

an objective lens;

an eyepiece disposed rearwardly of said objective lens;

a magnification changing lens disposed between said objective lens and said eyepiece;

a support member for supporting said magnification changing lens so that the principal point thereof can be changed from one to the other of the objective lens side position and the eyepiece side position relative to an object image formed between said objective lens and said eyepiece by said objective lens, said support member having a field stop for at least one of a state in which the principal point

of said magnification changing lens is positioned on the objective lens side and a state in which the principal point of said magnification changing lens is positioned on the eyepiece side; and

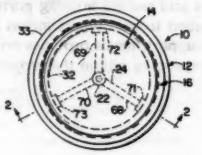
change-over means for moving said support member to change the principal point of said magnification changing lens from said one position to said other position, thereby changing over the magnification of said optical device.

4,548,482

REFLECTOR WITH EASILY REPLACEABLE REFLECTIVE MEMBRANE

Carl L. Williams, Jr., and Larry R. Payne, both of Abilene, Tex., assignors to LaJet Energy Company, Abilene, Tex.

Filed Apr. 12, 1983, Ser. No. 484,216
Int. Cl.⁴ G02B *7/18, 5/10*
U.S. Cl. 350—608 **18 Claims**



1. A reflector comprising:

an annular housing having an open end;

a ring;

a reflective, elastic membrane spanning the interior of said ring;

means for attaching said membrane to said ring in a gas-tight manner;

releasable fastening means, on said ring and said housing, for coupling said ring to said housing to close said open end in a gas-tight manner and for positively interlocking said ring and housing to prevent accidental relative axial movement therebetween; and

means, coupled to said housing, for evacuating the interior of said housing to thereby draw said reflective membrane into said housing,

said releasable fastening means comprising

a pair of downwardly facing and radially extending locking shoulders coupled to said housing, and

a pair of upwardly facing and radially extending locking shoulders coupled to said ring,

each of said upwardly facing locking shoulders being interlocked with one of said downwardly facing locking shoulders.

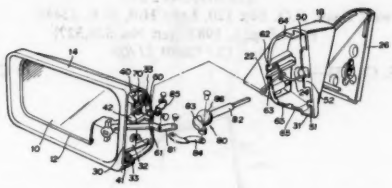
4,548,483

AUTOMOBILE DOOR MIRROR DEVICE HAVING A BUFFER MECHANISM

Shuji Moro, Hiratsuka, and Michio Tenmaya, Yono, both of Japan, assignors to Ichikoh Industries Limited and Honda Motor Co., Ltd., both of Tokyo, Japan

Filed Jul. 14, 1983, Ser. No. 513,860
Claims priority, application Japan, Jul. 19, 1982, 57-108154[U]; Jul. 19, 1982, 57-108155[U]
Int. Cl.⁴ G02B *7/18*
U.S. Cl. 350—635 **3 Claims**

1. A door mirror mount for automobiles of the type having a mirror housing, a mirror mounted on said housing and a base means in engagement with said housing for coupling said housing to an automobile through coupling means such that said housing is pivotable relative to said base against the force of spring means operating between said housing and said base means about two spaced fulcrums each corresponding respectively to forward and backward bending of said housing relative to said base means and the front and back of the automobile, said housing and said base means each having ends with each end having a peripheral edge, said peripheral edges of said housing and said base means being formed to smoothly engage one another without any external interruption, and adjacent thereto an interior surface, said housing having, extending from adjacent said respective interior surface of said edge of said housing, a first projection set including a plurality of projections defining a portionof one of said fulcrums to thereby locate one of said fulcrums, and a second projection set including a plurality of other projections defining a portion of the other of said fulcrums thereby locating said other fulcrum,



said base means having, extending from adjacent said respective interior surface of said edge of said base means a first projection set and a second projection set each set including at least two projections positioned such that when said edges of said housing and base means are engaged, said projections of said first sets of said housing and said base means and said projections of said second sets will be interspersed such that relative movement in a direction parallel to said one fulcrum and in a direction parallel to said other fulcrum will be prevented at least while said housing is moved from a rest position to a pivotted position, about one of said fulcrums and is returned to said rest position.

4,548,484

ATTACHMENT FOR SPECTACLE TEMPLES

Markus Ehring, Postfach 1132, 4788 Warstein, Fed. Rep. of Germany

PCT No. PCT/DE82/00159, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/00565, PCT Pub. Date Feb. 17, 1983
PCT Filed Aug. 5, 1982, Ser. No. 486,951
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131801
Int. Cl.⁴ G02C *5/14*
U.S. Cl. 351—123 **11 Claims**

1. An attachment for a spectacle temple, comprising:

a leg (2);

a substantially semicircular end portion (3) connected to one end of said leg, said leg having an opposite free end;

said leg having a horizontally extending open-ended oblong hole (4) therein, an upwardly U-shaped zone (5) on said one end of said leg adjacent said end portion (3) and communicating with said hole, and a downwardly open U-shaped zone (7) on said opposite free end of said leg, communicating with said hole, said upwardly open U-shaped zone being spaced from said downwardly open

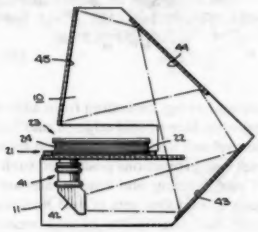
U-shaped zone along said leg with said oblong hole opening upwardly and downwardly through said leg between said upwardly and downwardly opened U-shaped zone whereby a spectacle template can be inserted through said oblong hole between said upwardly and downwardly open U-shaped zones and then rotated into a remainder of said oblong hole between said upwardly and downwardly U-shaped portions.

4,548,485

READING DEVICE FOR THE VISUALLY HANDICAPPED

Stewart Dean, P.O. Box 120, Lake Hill, N.Y. 12448

Filed Sep. 1, 1983, Ser. No. 528,527
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—67 **15 Claims**



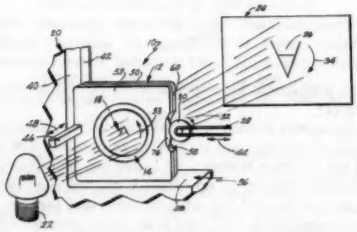
1. An optical viewing device to enable a visually handicapped person to read ordinary textual material, the device comprising a substantially horizontal stage for holding the textual material; means for moving the textual material parallel to the stage; means below the stage for illuminating the material on the stage; an objective to form imaging rays and provide a real image of the material; means for both reflecting the imaging rays from the objective through substantially 90 degrees and reinverting the imaging rays; a first reflecting surface; a second reflecting surface; and a substantially vertically oriented, directional, controlled brightness rear projection viewing screen, the imaging rays from the objective successively passing from the reflecting means and the first and second surfaces to form a real erect enlarged image of the material as viewed from the front of the screen.

4,548,486

TRANSPARENCY MOUNT PROVIDING ROTATABLE PROJECTION IMAGE

Kenneth C. Mosley, 219 Worcester, NE., Grand Rapids, Mich. 49503

Filed Jul. 6, 1983, Ser. No. 511,388
Int. Cl.[4] G03B *1/48*
U.S. Cl. 353—95 **18 Claims**



1. A slide mount for rotatably supporting a transparency in critical focus within a slide projector including means for registering a slide mount for critical focus, said slide mount comprising:

a generally planar support housing to be stationarily received within the registering means, said housing including first and second parallel generally planar housing portions defining first and second apertures, respectively;

wheel means for supporting a transparency for projection, said wheel means being rotatably supported between said housing portions, said wheel means defining a third aperture in which the transparency is supported, said first, second, and third apertures being aligned whereby light can be directed therethrough to project an image from the transparency, said wheel means including a driven portion engageable through said housing to be selectively engageable by a drive member on the projector;

first axial-support means for axially supporting said wheel means against said first housing portion; and

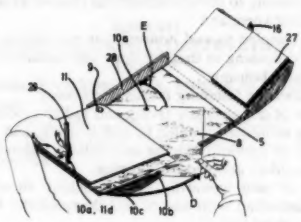
second axial-support means for axially supporting said wheel means against said second housing portion, whereby the support provided to said wheel means by said first and second axial-support means provides critical focus of the rotatable transparency within the projector.

4,548,487

PROTECTING DEVICE FOR TRANSPARENCIES

Bjarne M. Nielsen, Nordre Frihavnsgade 65, st.th., DK-2100 Copenhagen O, Denmark

Filed May 18, 1983, Ser. No. 495,602
Claims priority, application Denmark, May 21, 1982, 2307/82
Int. Cl.[4] G03B *21/54*
U.S. Cl. 353—120 **13 Claims**



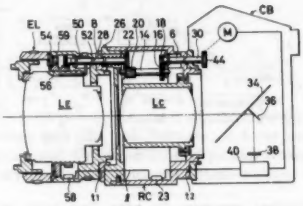
1. A protecting device for transparencies comprising: an unfoldable file having a bottom cover which forms a frame having a transparent window therein, said file having a pair of side members hinged to opposed edges of said bottom cover; a swivel pin mounted on said frame and extending perpendicularly to said frame; a swivel cover mounted on said pin for pivotal movement in a plane parallel to said bottom cover between a position overlying said window when said file is folded and a position offset from said window and overlying one of said side members when said file is in unfolded condition, said swivel cover being adapted to receive within it a plurality of transparencies to be pivotably mounted on said pin for independent pivotal movement about said pin into and out of said swivel cover so that when said swivel cover overlies said one side member in a file-unfolded condition, each transparency can be selectively pivoted between a position overlying said window and a position within said swivel cover; and a stop member attached to said bottom cover for stopping pivotal movement of each transparency when such transparency overlies said window.

4,548,488

CONVERSION LENS ASSEMBLY FOR AN AUTOMATIC FOCUSING SYSTEM IN A LENS EXCHANGEABLE CAMERA

Yasuhisa Honda, and Makoto Ando, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1983, Ser. No. 552,213
Claims priority, application Japan, Nov. 19, 1982, 57-204224; Apr. 11, 1983, 58-64184
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—402 9 Claims



1. In an automatic focusing system for a lens exchangeable camera, in which an exchangeable lens assembly attachable to a camera body includes a focusing optical system, a driven member, a focusing mechanism for adjusting said focusing optical system in response to movement of said driven member and signal means for providing a data signal which is representative of the ratio of the image plane displacement by the adjustment of said focusing optical system to the movement of said driven member, and in which said camera body includes a focus condition detection means for detecting the focus condition of said focusing optical system to generate a focus condition signal, a driving member capable of being coupled with said driven member, a motor rotatable for driving said driving member, and a control circuit for controlling the rotation of said motor in response to said focus condition signal and said data signal so that said focusing optical system is brought into an in-focus condition by said focusing mechanism through the coupling between said driving and driven members, a conversion lens assembly adapted to be interposed between said camera body and said exchangeable lens, comprising:

a conversion lens unit having a predetermined magnification power M;

an intermediate driven member capable of being coupled with said driving member;

an intermediate driving member capable of being coupled with said driven member;

drive transmission means for transmitting movement of said intermediate driven member to said intermediate driving member with a predetermined transmission coefficient μc to cause movement of said intermediate driving member the amount of which is the product of said transmission coefficient and the amount of movement of said intermediate driven member, said transmission coefficient μc being larger than 1 when said magnification power M is smaller than 1, while being smaller than 1 when said magnification power M is larger than 1; and,

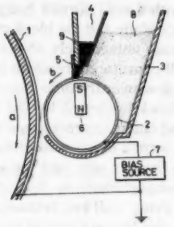
signal transmission means for transmitting said data signal to said control circuit with a predetermined transmission coefficient ηc so that said control circuit receives said data signal multiplied by said transmission coefficient ηc.

4,548,489

DEVICE FOR FORMING A THIN LAYER OF DEVELOPER

Masao Yoshikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,574
Claims priority, application Japan, Feb. 19, 1982, 57-25676
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD 3 Claims



1. A device for forming a layer of non-magnetic developer particles on a surface of a developer carrying member comprising:

means for providing magnetic particles and non-magnetic developer particles onto the developer carrying member;

a magnetic blade disposed with a clearance to the developer carrying member;

a magnet stationarily disposed across the developer carrying member from said magnetic blade to form a magnetic field between said magnetic blade and said magnet to confine the magnetic particles; and

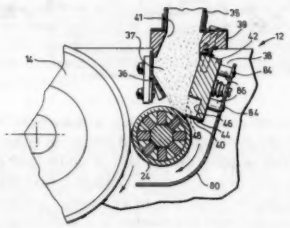
means for moving the developer carrying member to carry the non-magnetic developer particles thereon and pass them by a region of the confined magnetic particles to form a thin layer of the non-magnetic developer particles on the developer carrying member.

4,548,490

TONER FEEDER SYSTEM

John C. Stirrat, West Hill; Kenneth L. Hurley, Unionville, and Brian F. Whittaker, Toronto, all of Canada, assignors to Delphax Systems, Mississauga, Canada

Filed Aug. 16, 1983, Ser. No. 523,918
Claims priority, application Canada, Aug. 24, 1982, 409997
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 5 Claims



1. A toner feeder for supplying a controlled thickness of toner to a magnetic roller which carries the toner for toning a latent electrostatic image onto a dielectric or photoreceptor surface prior to transferring the toned image from this surface onto a receptor medium, the toner feeder comprising:

a support defining an opening for receiving toner under gravity;

an elongate retaining plate attached to the support and extending downwardly from the support and axially, the plate having an edge to be placed adjacent the roller to prevent flow of toner between the blade and the roller;

an elongate block adjustably coupled to the support and extending parallel to the retaining plate;

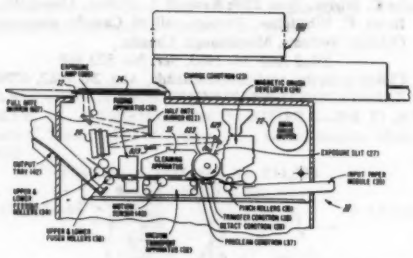
an elongate doctor blade attached to the block and lying axially and having an edge for placement adjacent the roller for forming with the roller a gap through which toner passes carried by the roller, the block having a support wall with a wall portion lying above the doctor blade, the doctor blade and the block combining to define an elongate recess immediately above the doctor blade, the support wall constituting reaction means so that in use toner flowing downwardly onto the roller between the plate and the block is carried by the roller towards the doctor blade and enters the recess and the reaction means causes toner to form a living wall in the recess, the living wall being of a limiting size, and the support wall in the recess being proportioned so that toner continuously attaches to the living wall and releases when the limiting size is reached, the limiting size of the living wall being sufficient to prevent toner agglomeration and biuld-up on the doctor blade.

4,548,491

COUNTERBALANCE SUBSYSTEM TO ACCOMMODATE A VARIABLE CENTER OF GRAVITY

Harry F. Eiland, Cerritos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,882
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **12 Claims**



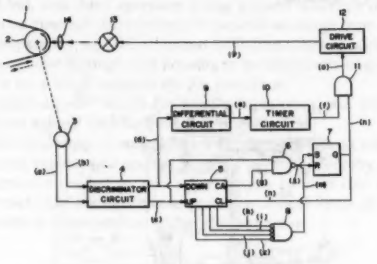
1. A dual mode copier comprising a document handling module selectively positioned on said copier in either of two positions, said first position on one side of said copier for presenting to the copier first type documents in a first mode, said second position on the other side of said copier for presenting to the copier second type documents in a second mode, said module capable of being opened to provide access to the inside, non-copying area of said copier from either of said two positions, the first position of said module being directly over the body of said copier, while in said second position said module is positioned such that a portion of said module overhangs the periphery of the body of said copier, and including mechanical assistance means for assisting in opening the module in either of said two positions.

4,548,492

SIDE PRINTING APPARATUS

Takeshi Kanaoka; Katutoshi Nakamura, and Shigehisa Shimizu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 28, 1983, Ser. No. 555,537
Claims priority, application Japan, Nov. 27, 1982, 57-208226
Int. Cl.⁴ G03B *27/48, 27/50*
U.S. Cl. 355—50 **5 Claims**



1. A side printing apparatus for providing latent images of characters, numerals, symbols and the like on a photographic film moving continuously by exposing it to light images produced by a light image forming device, said apparatus comprising:

film length detection means for detecting the moved length of the film so as to produce a first series of pulse signals corresponding to the movement of the film in a forward direction and a second series of pule signals corresponding to the movement of the film in a reverse direction;

an up/down counter for counting up said reverse direction pulse signals and counting down said forward direction pulse signals; and

a drive circuit for controlling said light image forming device; said up/down counter commencing counting up at the beginning of the production of said reverse direction pulse signals and simultaneously said drive circuit causing de-energization of said light image forming device, said up/down counter stopping counting down upon reaching a predetermined count down of said forward direction pulse signals and simultaneously said drive circuit causing energization of said light image forming device, thereby preventing double exposure of the film.

4,548,493

MASK TRANSFERENCE AND ALIGNMENT APPARATUS

William C. Mayfield, 4945 Alhama Dr., Woodland Hills, Calif. 91364

Filed Apr. 10, 1984, Ser. No. 598,815
Int. Cl.⁴ G03B *27/28*
U.S. Cl. 355—125 **11 Claims**

1. A film mask transference and alignment apparatus comprising the combination of:

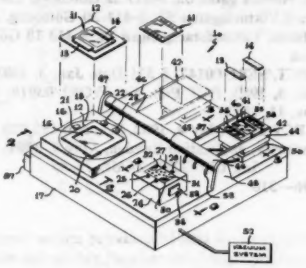
a base;

at least two fixed platforms carried on said base in fixed spaced apart relationship supporting a mounted slide and a film mask respectively;

a pickup means movably carried on said base for separate and sequential registry with said platforms;

said pickup means includes a pair of spaced adhesive strips releasably held in position to register with edge marginal regions of said film mask when in a first position immediately adjacent said fixed platform supporting said film mask and to register with edge marginal regions of said mounted slide when in a second position immediately adjacent said fixed platform supporting said mounted slide;

vacuum means operably coupled to said film mask platform and said pickup means for releasably holding said film mask and said adhesive strips to their respective platforms and pickup means; and



control means operably connected to said vacuum means for releasing said film msk from its platform and releasably securing said film mask on said pickup means in specific location with respect to said adhesive strips.

4,548,494

METHOD FOR ADJUSTING TWO ENDS OF TWO OPTICAL FIBERS TO BE CONNECTED TO ONE ANOTHER

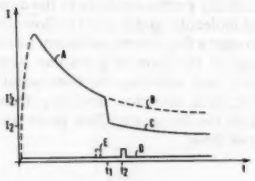
Siegfried Geckeler, and Dieter Schicketanz, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 88,171, Oct. 25, 1979, abandoned. This application Jan. 12, 1982, Ser. No. 338,980

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1978, 2850430

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—73.1 **1 Claim**



1. A method for adjusting the positions of two ends of a pair of aligned optical fibers with at least one fiber of the pair being an installed fiber of an optical communication system and simultaneously forming a permanent connection between the pair of adjusted ends of said fibers, said method comprising the steps of coupling a light pulse into a free end of said one fiber of said pair of fibers; measuring the intensity of a back-scattering of the light pulse received at said free end of said one fiber; determining an abrupt change in the intensity of the back-scattered light at said free end of said one fiber corresponding to the point of connection to be made for said pair of fibers; generating a signal corresponding to the intensity change being determined; then adjusting the position of the two ends of the pair of fibers until the signal being received matches the signal with the smallest amount of deviation from a given value and then completing the forming of the permanent connection between the two ends so that the amount of the abrupt change in the intensity being determined is decreased to the smallest determined amount to indicate the alignment of the two ends which are being connected together, said adjusting including converting the amount of deviation into an acoustical frequency, said acoustical frequency being transmitted to be received adjacent a location of the two ends being adjusted so that the worker can sense when alignment is obtained.

4,548,495

PROPER FOCUSING STATE DETECTING DEVICE

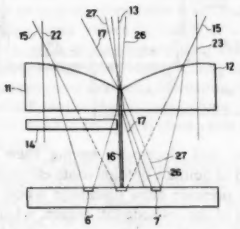
Takeomi Suzuki, 6-38-16, Higashi-Ohizumi-Machi, Nerima-ku, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,603

Claims priority, application Japan, Feb. 27, 1981, 56-27879; Oct. 3, 1981, 56-157791

Int. Cl.[4] G07J *1/20*

U.S. Cl. 356—123 **13 Claims**



1. A focus detecting system for detecting a focus position of an image forming optical system into an object, said optical system having an image forming lens and a predetermined focal plane, said detecting system comprising:

(A) dividing means for substantially dividing an effective area of said image forming lens of said optical system into two divided areas;

(B) a pair of sensor arrays of light sensing elements, each of said sensor arrays being disposed to accept each of two divided light beams which have passed through each of said divided areas of said image forming lens, respectively, said sensor arrays being disposed in orthogonal relationship to the direction of a line connecting gravity centers of said divided areas of said image forming lens;

(C) spatial filter means disposed between said pair of sensor arrays and said image forming lens, having transparent areas such that the direction of a line connecting gravity centers of said divided light beams, after having passed through said spatial filter means, has a selected angular relationship to a direction of extent of said sensor array; and

(D) means for lengthening the optical path length of one of said divided light beams compared to that of the other divided light beams, whereby the focus position of the optical system is detected, not only by way of the detection of a relative shift of location of the optical images of said divided light beam, but also by way of the detection of a difference between the sharpness of the optical images of said divided light beams from image signals of said sensor arrays.

4,548,496

NON-OBSTRUCTING LASER BEAM SAMPLING METER

Thomas G. Roberts, Huntsville, and Thomas E. Honeycutt, Somerville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

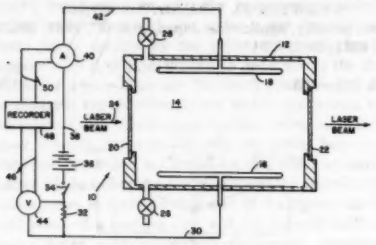
Filed May 31, 1983, Ser. No. 499,593

Int. Cl.[4] G01J *1/00*

U.S. Cl. 356—213 **4 Claims**

1. A laser beam sampling meter comprising a cavity having a chamber therein, laser windows mounted in opposite walls of said cavity, electrodes mounted in said cavity and being positioned perpendicular to said laser windows to define an area between said electrodes through which laser light passing

through said windows will pass between said electrodes, said electrodes each having plane parallel surfaces, said chamber having an inert gas of low pressure therein, and a circuit including a power supply, an on-off switch and a limiting resistor all connected in series across said electrodes and meter measuring means connected in said circuit for measuring power across



said electrodes, said electrodes having their plane parallel surfaces spaced to define a optogalvonic effect in the electrode space of a low pressure glow discharge where the entire discharge consists of the cathode-fall region, where the dynamic resistance of the discharge is positive, and where high total currents can flow without driving the discharge unstable.

4,548,497

METHOD AND DEVICE FOR INTRODUCING A SAMPLE INTO A GRAPHITE TUBE

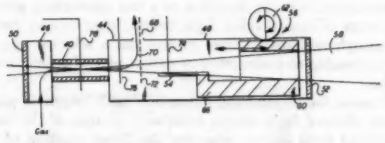
Bernhard Huber, Überlingen; Rolf G. A. Tamm, Salem; Toma Tomoff, and Winfried Gönner, both of Überlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,635

Claims priority, application European Pat. Off., Nov. 25, 1981, 81 109 879.7

Int. Cl.[4] G01N *21/74*

U.S. Cl. 356—312 **5 Claims**



1. Device for introducing a sample in a graphite tube comprising:

a lamella- or crucible-like sample carrier to which said sample is applied, said sample carrier being formed of an elongated flat part of substantially rectangular shape, which flat part provides a shallow recess on one end, said recess is laterally displaced on said part, said part including a longitudinal slot extending from the first end remote from said recess over nearly the entire length of said part laterally past said recess to shortly in front of the second end;

means for moving the sample carrier into a first position outside said graphite tube whereat ashing of said sample is accomplished, said means being disposed of in front of an end face of said tube and outside of the path of rays of a measuring light beam;

means for moving said sample carrier into a second position inside said graphite tube whereat atomization of said sample is effected, said means maintaining said sample carrier below said measuring light beam.

4,548,498

LASER INDUCED FLUORESCENCE DETECTION IN MODERN LIQUID CHROMATOGRAPHY WITH CONVENTIONAL AND MICRO COLUMNS

Sven S. Folestad, Krukmakaregatan 1 C, S-414 60 Göteborg; Bo G. Galle, Norska gatan 32, S-417 22 Göteborg; Lars Göran I. Johnson, S.Viktoriagatan 52, S-411 30 Göteborg, and Björn O. Josefsson, Vaktmästaregången 16, S-413 18 Göteborg, all of Sweden

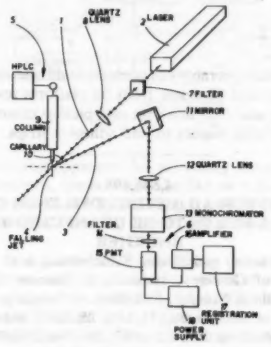
PCT No. PCT/SE82/00147, § 371 Date Jan. 3, 1983, § 102(e) Date Jan. 3, 1983, PCT Pub. No. WO82/03918, PCT Pub. Date Nov. 11, 1982

PCT Filed May 4, 1982, Ser. No. 457,070

Claims priority, application Sweden, May 4, 1981, 8102772

Int. Cl.[4] G01N *21/64, 21/85*

U.S. Cl. 356—318 **11 Claims**



1. A method of detecting laser induced fluorescence in a liquid flowing in a chosen flow direction, to detect the occurrence of at least one chemical component in the liquid, comprising the steps of: directing a single light beam from a laser source substantially perpendicularly to the direction of flow to thereby cause molecules at one point of flow illuminated by the light beam to emit a fluorescent radiation; causing the liquid to pass said point in the form of a column with an accurately defined surface; and receiving the fluorescent radiation, by a receiving unit, in a direction deviating from the direction emanating from the illuminated flow point perpendicularly to the direction of flow.

4,548,499

ARRANGEMENT FOR MEASURING FLUORESCENCE POLARIZATION

Wolfgang Eisert, Hanover, and Wolfgang Beisker, Garbsen, both of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH, Neuherberg, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,282

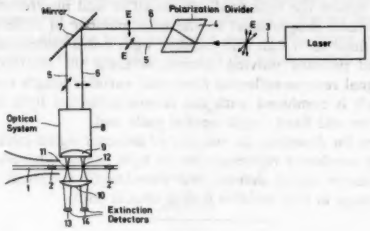
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208919

Int. Cl.[4] G01N *21/64*

U.S. Cl. 356—318 **5 Claims**

1. An arrangement for measuring the fluorescence polarization of cells which are aligned individually along a flow stream and illuminated by means of an illumination field, comprising in combination: means for producing first and second spaced excitation beams of light with the direction of polarization of said excitation beams being perpendicular to one another; means for passing the cells whose fluorescence polarization is to be measured in succession through said first and second light beams at respective spaced points so as to excite fluorescence at each of said points; first and second detector means for successively detecting the respective two polarization compo-

nents of the cell fluorescence at said spaced points of excitation; and analysis system means, responsive to the detected



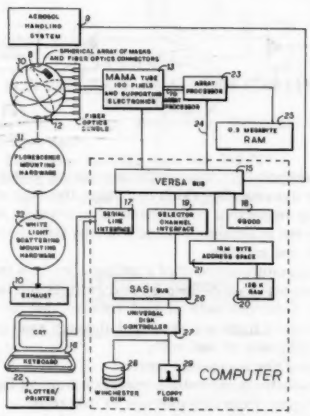
fluorescence values provided by said first and second detector means, for calculating the corrected degree of fluorescence for the individual cells from said detected values.

4,548,500

PROCESS AND APPARATUS FOR IDENTIFYING OR CHARACTERIZING SMALL PARTICLES

Philip J. Wyatt, 1939 Laguna St., Santa Barbara, Calif. 93101, and Gregory M. Quist, 6750 El Colegio, Apt. #49, Goleta, Calif. 93117

Filed Jun. 22, 1982, Ser. No. 390,980
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—336 **16 Claims**



1. A process for characterizing and identifying a single unknown microparticle within a range of interest on the basis of physical properties derived from measured optical observables comprising the steps of:

A. Introducing microparticles one-at-a-time into a flowing laminar stream surrounded by a particle-free sheath of the same material as the stream;

B. Passing said stream containing said entrained microparticles through a narrow beam of electromagnetic radiation;

C. Surrounding said radiation beam and microparticle stream by means able to support a number of discrete detector means at selected angular locations about said radiation beam and microparticle stream, with said support means not obstructing the entrance and exit of either particle stream or radiation beam from said surrounding region and said number and locations of detector means being sufficient to yield a unique range of optical observable values characteristic of that expected from the microparticles of interest;

D. Detecting the radiation scattered by each said microparticle as it passes through the radiation beam at each of the selected surrounding detector means;

E. Converting each said detected scattered radiation intensity into a proportional numerical value;

F. Storing said numerical values in a memory means with separate memory means corresponding to each discrete detector means;

G. Deriving measured optical observable values by combining sufficient selected sets of stored numerical values to yield a set of optical observables spanning the range of observables characteristic of the particles of interest;

H. Defining an optical observable map for a fixed range of optical observable values in terms of a set of physical parameters, each physical parameter restricted to a domain encompassing those characteristic of the microparticles of interest, and said map consisting of closed regions within which ranges the circumscribing physical parameters would result in an optical observable within the defining fixed range;

I. Retrieving from memory means previously stored maps of optical observables, one map for each measured optical observable value and whose range of optical observable values bracket the corresponding computed value;

J. Superimposing a sufficient number of said retrieved maps of optical observables to yield a unique and finite region of overlap;

K. Identifying the range of each particle's physical parameters corresponding to the common overlap region of said retrieved maps; and

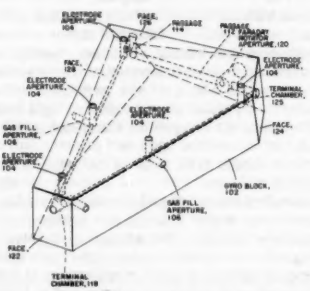
L. Classifying and identifying the unknown microparticle by the values of the physical parameters defined by the optical observable map overlap region.

4,548,501

LASER GYROSCOPE SYSTEM

Irl W. Smith, and Terry A. Dorschner, both of Newton, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 140,908, Apr. 16, 1980, abandoned, which is a continuation of Ser. No. 868,096, Jan. 3, 1978, abandoned. This application Jul. 6, 1982, Ser. No. 395,524
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **4 Claims**



1. An electromagnetic wave ring resonator comprising:

means for producing a frequency split between electromagnetic waves having opposite polarization handedness comprising a closed nonplanar path for sustaining the propagation of circularly polarized electromagnetic waves having first and second polarization handedness;

means comprising a solid segment of said path for providing

different propagation times for electromagnetic waves traveling in opposite directions along said path, said solid segment being less than one-half millimeter long and being self-supporting in the region of said path and the aperture of said path in the region of said segment being substantially greater than one-half millimeter;

said different propagation times providing means further comprising means for producing a magnetic field in the solid segment of said path, said magnetic field having a component parallel to said path; and

means for producing an indication of the rate of rotation of the electromagnetic wave ring resonator.

4,548,502

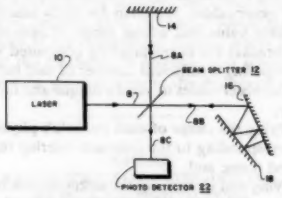
ULTRA-HIGH SENSITIVITY INTERFEROMETER

Suresh Chandra, Falls Church, Va. and Robert S. Rohde, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 398,179, Jul. 14, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 683,960

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—358 **4 Claims**



1. An ultra-high sensitivity multiple reflections interferometer of the type that compares light reflected from a fixed length optical path and light reflected from a variable length optical path, said interferometer comprising:

a coherent light source producing a light beam therefrom;

a beam splitter in optical alignment with the coherent light beam, said beam splitter having partial transmission and reflection according to the need for maximum signal detection;

a fixed reflector at the end of the fixed length optical path positioned normal to a reflected portion of said coherent light beam off said beam splitter wherein said fixed reflector reverse-reflects said coherent light beam back to said beam splitter;

an enhanced sensitivity optical path displacement means at the end of the variable length optical path in optical alignment with said coherent light beam and said beam splitter, said optical path displacement means comprised of a two-mirror wedge having a primary moving mirror surface target and a fixed secondary mirror associated therewith to vary the length of the variable length optical path wherein a portion of said coherent light beam transmitted through said beam splitter along said variable length optical path is incident upon said primary mirror of said two-mirror wedge at an angle of incidence α from the normal and is reflected from said primary mirror toward said secondary mirror of said two-mirror wedge in which said secondary mirror is titled at a wedge angle θ from said primary mirror so that angle α is an integral multiple of angle θ wherein said incident light beam which strikes said primary mirror at angle α undergoes at least two reflections off said secondary mirror and at least three reflections off said primary mirror in accordance with the established wedge angle θ between said primary and secondary mirrors and the chosen integral multiple of angle α with respect to angle θ until said incident light beam becomes normal at one of the primary or secondary mirror surfaces and returns exactly back on itself undergoing the same multiple reflections within said two-mirror wedge wherein the variable length optical path is extended to a representative normal reflection from a virtual image directly behind said primary mirror and wherein said incident light beam reverse-reflects from said two-mirror wedge as an interference signal back to said beam splitter in which the enhanced sensitivity of said interferometer directly proportional to the total number of reflections defined as N that said incident light beam undergoes off said primary moving mirror, wherein the interference signal reverse-reflected from said variable length optical path is combined with the reverse-reflected light beam from said fixed length optical path; and

means for detecting the number of detector signal cycles of the combined reverse-reflected light beams wherein one detector signal defines one wavelength λ optical path change in said variable length optical path.

4,548,503

METHOD OF AND APPARATUS FOR MONITORING A DYNAMIC CONDITION OF ROLLING-MILL ROLLS

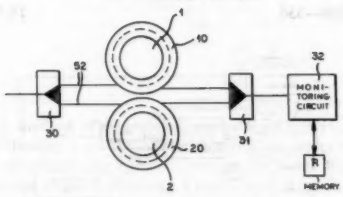
Jean Liesch; Jacques Metzdorf, both of Esch; André Meyers; Joseph Neu, both of Pontpierre, and Jean Redo, Esch, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Feb. 11, 1983, Ser. No. 465,995

Claims priority, application Luxembourg, May 12, 1982, 84145

Int. Cl.[4] B23Q *15/00, 15/12;* **G01B** *9/08, 11/14*

U.S. Cl. 356—373 **6 Claims**



1. A method of continuously monitoring a pair of rolling-mill rolls dynamically which comprises the steps of:

forming respective circumferential grooves in each of said rolls but in a common plane whereby said grooves register with one another;

prior to commencement of a rolling operation training light through a space defined by said grooves and between said rolls from one side of said rolls so that an acceptable pattern of light is transmitted through said space to the opposite side of said rolls;

recording the acceptable pattern;

continuously during rolling operation training light through said space from said one side of said rolls;

detecting the pattern of light transmitted through said space on the opposite side of said rolls continuously during said rolling operation; and

continuously comparing the detected pattern with the stored acceptable pattern.

4,548,504

DEVICE FOR DETERMINING THE REAL OR THE VIRTUAL DISTANCE OF A SOURCE OF LIGHT FROM A MEASURING PLANE

Karl-Erik Morander, P. O. Box 2025, S-443 02 Lerum, Sweden

Filed Jul. 23, 1982, Ser. No. 401,418

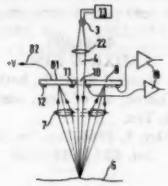
Claims priority, application European Pat. Off., Aug. 11, 1981, 81106262.9

Int. Cl.[4] G01B *11/24;* **G01N** *21/57*

U.S. Cl. 356—375 **8 Claims**

1. A device for determining the real or the virtual distance of a source of light from a spot illuminated on a measuring plane

by said light source, comprising a photodetector consisting of a photosensitive substrate and two electrodes being arranged on top thereof, an optical imaging system imaging light reflected from the illuminated spot on the measuring plane onto the substrate at a given point, the position of said point depending on the distance to be measured, and an evaluating circuit connected to the two electrodes and the substrate and supply-



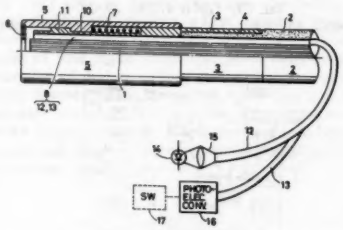
ing an output signal, said output signal depending on the position of the imaging point between the electrodes, characterized in that the electrodes have the form of circular annuli and are disposed concentrically relative to one another, and that the optical imaging system is formed by a torus-shaped lens, the radial section through the torus body being lens-shaped so that a spot of light reflected from the illuminated spot results in an image of an approximately circular line on the substrate.

4,548,505

SENSOR FOR SPECTRAL ANALYZER FOR LIVING TISSUES

Kimizo Ono, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Apr. 19, 1982, Ser. No. 369,767
Claims priority, application Japan, Apr. 22, 1981, 56-60775
Int. Cl.[3] G01N *21/55*; A61B *5/00*
U.S. Cl. 356—445 **7 Claims**



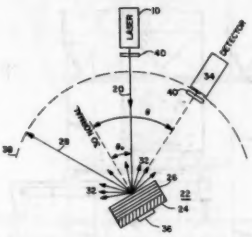
1. A sensor for a spectral analyzer for living tissues comprising; a holder, a bundle of fibers held in position in said holder and connected to the analyzer, a probe including a reflector fitted to an end thereof, said probe being axially movable by a predetermined distance with respect to said holder, a light transmitting/receiving fiber connected to a switch circuit of said analyzer, and a spring positioned between said holder and said probe for urging said reflector away from a tip of the light transmitting/receiving fiber, said switch being actuated so as to be turned on in response to a decrease in the intensity of the light reflected into said fiber due to a decrease in a distance between said tip of the light transmitting/receiving fiber and said reflector.

4,548,506

NONDESTRUCTIVE ANALYSIS OF MULTILAYER ROUGHNESS CORRELATION

John M. Elson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 26, 1979, Ser. No. 106,788
Int. Cl.[4] G01N *21/48*
U.S. Cl. 356—446 **6 Claims**



1. A method for determining the correlation between layers in dielectric multilayers by nondestructive testing comprising the steps of:

illuminating a dielectric multilayer with a beam of monochromatic light at a predetermined angle of incidence;

measuring the angular distribution of scattered light from said multilayer stack;

calculating the angular distribution of scattered light from said multilayer stack based on an assumed correlation relation between said multilayers;

comparing said measured angular distribution to said calculated angular distribution;

repeating said calculating and comparing steps for different assumed correlations between said multilayers until the closest fit between said calculated and measured angular distribution is identified; and

redoing said illuminating, measuring, calculating, comparing, and repeating steps for a different angle of incidence of light on said multilayer stack a plurality of times, said plurality being determined by the number of different angles of incidence needed to evaluate a characteristic correlation relationship describing said multilayer stack for all angles of incidence.

4,548,507

MIXING APPARATUS FOR THE PRODUCTION OF MIXTURES

Paul Mathis, Merdingen, and Max Zimmer, Efringen-Kirchen, both of Fed. Rep. of Germany, assignors to Mathis System-Technik GmbH, Neuenburg, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,369
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236780
Int. Cl.[4] B28C *5/14, 7/16*; B01F *15/02*
U.S. Cl. 366—20 **27 Claims**

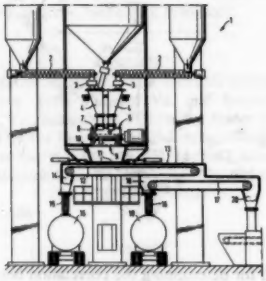
1. Mixing apparatus for forming successive batches of mixtures containing identical or different types of particulate solids, particularly dry mortar, concrete, feedstuffs, fertilizers, foodstuffs and the like, comprising:

(a) a mixer including at least one mixing element arranged to impart motion to the contents of the mixer, said mixer constituting the sole means for storing the batch of mixture which is formed therein;

(b) metering means for introducing predetermined amounts of selected components to be mixed into said mixer and to be set in motion by said mixing element so that the contents of the mixer are converted into a batch of intermixed components; and

(c) self-cleaning conveyor means for transporting the mix-

ture formed in said mixer away from the latter, said mixer including delivery means for discharging the mixture to said conveyor means, and said delivery means being movable between a first position in which said delivery means defines an outlet opening for the mixture, and a second position in which said outlet opening is sealed, said mixer being designed in such a manner that the mixture, including virtually all residues thereof, is discharged from said mixer by gravity in response to movement of said delivery means to said first position so that the apparatus is ready to form a different mixture without appreciable delay following the making of the last batch of a preceding mixture whereby the different mixture is not contaminated or otherwise adversely influenced by the components of the preceding mixture.



4,548,508

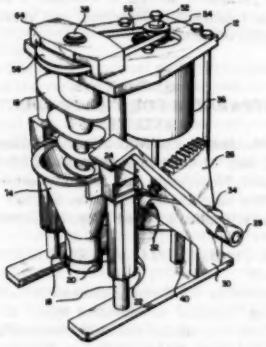
FROZEN DESSERT MIXER

Charles E. Verkler, Peoria, Ill., assignor to International Food Equipment Inc., Peoria, Ill.

Filed Jan. 9, 1984, Ser. No. 569,475

Int. Cl.[3] A23G *9/02, 9/04*

U.S. Cl. 366—195 **12 Claims**



1. In a device for mixing food products having an auger mixing element and a vertically reciprocating mixing container cone, said mixing element and said mixing container cone both being mounted on a support structure including two parallel vertical guides for said mixing container, means for extruding a steady flow of mixed food product at a selectable rate comprising:

an arc gear rotatably mounted on said support structure;

a rack gear slidably mounted on at least one of said parallel vertical guides and connected to said mixing container cone;

a pinion gear rotably mounted on said device and intercoupled between said arc gear and said rack gear;

means for rotating said arc gear; and

means defining an extrusion opening in said mixing container cone to allow said food product to be extruded from said mixing container cone as said cone is driven vertically into operational contact with said auger.

4,548,509

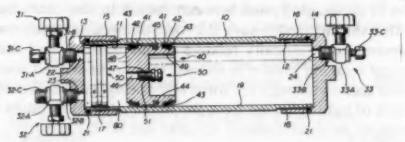
MIXING DISC

Kenneth S. Parrott; Wendell K. Gillis, both of Spring, and Bernard C. Baros, Conroe, all of Tex., assignors to Clif Mock Company, Conroe, Tex.

Filed Oct. 5, 1984, Ser. No. 658,377

Int. Cl.[3] B01F *5/06*

U.S. Cl. 366—349 **10 Claims**



1. In a fluid sampling device having an invertible, sample-receiving cylinder, the improvement comprising a fluid mixing member, said mixing member including:

a centrally bored housing, movable within said cylinder;

a pair of spaced apart mesh members centrally positioned within said housing bore, each said mesh member including a first plurality of shear-causing elements arranged substantially perpendicular to a second plurality of shear-causing elements; and

the shear-causing elements of one of said mesh members are arcuately out of phase with the shear-causing elements of the other of said mesh members.

4,548,510

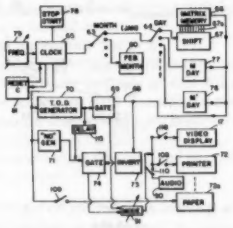
SELECTIVE TIME SCHEDULER AND SUBSCHEDULER

Alfred B. Levine, P.O. Box 9516, Washington, D.C. 20016

Filed Jan. 5, 1984, Ser. No. 568,359

Int. Cl.[4] G04B *47/00, 19/24*

U.S. Cl. 368—10 **19 Claims**



1. In an electronic time scheduler having a memory and keyboard for enabling a user to enter and store in the memory time schedules of events and appointments, and including read-out means for selectively reading out daily schedules of such events and appointments for selected days, said read-out means selectively controlled by the user to read-out a daily schedule for any selected day of nonscheduled time periods, and said read-out means including mode selection means controlled by the user for selectively reading-out a combined schedule of events and appointments together with said sched-

ule of nonscheduled time periods for that day; the schedule of events and appointments alone; and the schedule of nonscheduled time periods alone.

4,548,511

ELECTRONIC TIMEPIECE WITH VOICE MEMORY

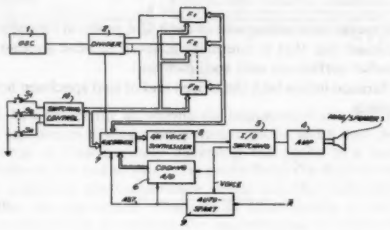
Hiroshi Yabe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,427

Claims priority, application Japan, Oct. 8, 1981, 56-160689; Jun. 14, 1982, 57-101535; Sep. 8, 1982, 57-156098

Int. Cl.[3] G04B *47/00, 21/08*

U.S. Cl. 368—10 **41 Claims**



1. In an electronic timepiece, the improvement therein comprising:

a microphone and loudspeaker means for receiving and outputting voice signals;

recording means for receiving said voice signals from said microphone means and storing voice data representative of said voice signals;

output means for reading out the data stored in said recording means and transforming said data signals into voice signals for output by said loudspeaker means;

a start circuit including a level detector, said level detector detecting the amplitude of voice signals inputted externally to said microphone means, said start circuit initiating operation of said recording means in response to an output from said level detector, said level detector providing said output when the amplitude of said incoming voice signal to said microphone exceeds a predetermined level, said recording means including memory means for storage of said voice data, said memory means comprising a RAM being divided into regions, a first region of said memory means storing said voice data incoming prior to occurrence of said signal from said level detector initiating operation of said recording means, a second said region being devoted to the storage of voice data inputted after initiation of operation of said recording means in response to the output of said level detector, said data being stored in said first memory region upon setting of said timepiece in a record mode.

4,548,512

WATCH WITH INDICATOR OF LUNAR PHASES

Raoul-Henri Erard, 82, Boulevard des Endroits, 2300-La Chaux-de-Fonds, Switzerland

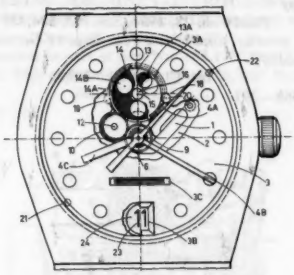
Filed Oct. 18, 1983, Ser. No. 543,033

Claims priority, application Switzerland, Oct. 27, 1982, 6262/82

Int. Cl.[4] G04B *19/26*

U.S. Cl. 368—15 **7 Claims**

1. Watch with moon phases indicator and a movement, comprising two indicator members which are superposed and parallel to the movement, the lower member having a dark circle on its upper face that represents the color of the night sky and a bright surface surrounding said dark circle, the upper member having a circular hole through which said dark circle is visible and a dark surface surrounding said hole, and means for simultaneously rotating said indicator members at a speed such that the upper member completes one full revolution in the time between two passages of the moon past the meridian of the sky, and such that the lower member rotates at a speed



that differs from the speed of the upper member by an amount such that the portion of said dark circle that is visible through said hole leaves exposed through said hole only a portion of said bright surface that varies as the phases of the moon.

4,548,513

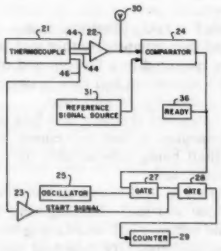
METHOD AND APPARATUS FOR MEASURING RESPONSE TIME

Edward W. Johanson, New Lenox, and Charles August, Darien, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 11, 1983, Ser. No. 522,282

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—9 **7 Claims**



1. A method of measuring the response time of a thermocouple which generates an output signal in response to the application of a specified input, wherein the output signal varies as a function of time and when subjected to a step input approaches a steady-state value, comprises the steps of:

(a) applying a step input of a predetermined value to the thermocouple to generate an output signal;

(b) simultaneously starting a timer;

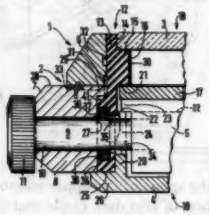
(c) comparing the output signal to a reference signal to generate a stop signal when the output signal is substantially equal to the reference signal, the reference signal being a specified percentage of the steady-state value of the output signal corresponding to the predetermined value of the step input; and

(d) applying the stop signal when generated to stop the timer.

4,548,514
WRISTWATCH HAVING TUBULAR SEAL AND METHOD FOR ASSEMBLY

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Feb. 28, 1984, Ser. No. 584,339
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 8306359[U]
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—291 8 Claims



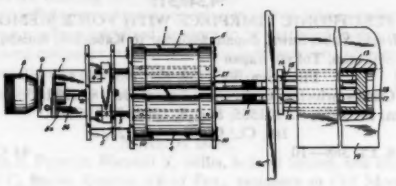
1. A wristwatch comprising:
a clamping ring having an opening extending axially therethrough and a first passage extending therethrough in a radial direction with reference to the axis of said opening, said opening including a limiting surface disposed axially inwardly from an upper end of said clamping ring,
a hollow cylindrical seal in the form of a hard plastic tube disposed generally coaxially in said opening and including:
a radially inward projection on an inner wall thereof to form, together with an axially extending portion of said tube, a cylindrical seat at an upper end of said tube,
a radially outward projection forming a radially outwardly facing recess, said projection underlying said limiting surface to limit the extent of upward travel of said tube in said clamping ring, and
a second passage aligned with said recess and with said first passage,
a crystal mounted in said cylindrical seat,
a movement and face mounted within said tube,
a bottom cover mounted in a bottom end of said tube and confining said movement and face between itself and the underside of a shoulder of said tube,
a setting shaft extending through said first and second passages and connected to said movement, the diameter of said setting shaft being substantially the same as that of said first passage, and
an O-ring disposed in said recess so as to be confined between said tube and said clamping ring in surrounding relation to said setting shaft, said O-ring being formed of a material of greater elasticity than said tube and arranged in sealing relationship with said shaft.

4,548,515
MULTIPLE SENSOR DILATOMETER

Gerhard R. Clusener, 112 Reni Rd., Manhasset, N.Y. 11030

Filed Apr. 23, 1984, Ser. No. 602,967
Int. Cl.[4] G01N *25/16*
U.S. Cl. 374—56 18 Claims

1. Dilatometer comprising
(a) a measuring head having at least two independently operating linear variable differential transformer dilation sensors which are positioned in a closely spaced apart cluster, each said sensor being parallel, abreast and adjacent to each other, the coil of each said sensor being axially movable by and supporting an end of a separate tandemly positioned pushrod, the other end of said pushrod being adapted to abut a flat surface on a separate specimen, and each said pushrod and its supporting coil being coupled at a position on said coil proximate to the axis of said cluster of sensors so that all said pushrods are positioned parallel, abreast and closely spaced apart,
(b) a tubular specimen holder having an open end, into which

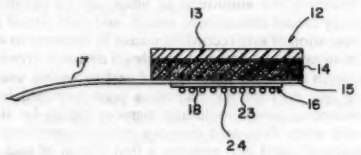


the specimen abutting end of each said pushrod extends, and a closed end that is internally adapted to abut another flat parallel surface on said specimen and
(c) a furnace into which the closed end of said specimen holder extends.

4,548,516
SEQUENTIAL THERMOGRAPHY FLUID FLOW INDICATOR

Tomasz K. Helenowski, 6831 N. Algonquin Ave., Chicago, Ill. 60646

Filed Dec. 24, 1984, Ser. No. 686,094
Int. Cl.[4] G01F *1/68*
U.S. Cl. 374—135 10 Claims



1. An apparatus for non-invasively determining the rate of flow of fluids in an embedded shunt through thermal comparisons comprising,
(a) a probe having a rigid base layer, an intermediate layer of resilient material and a flexible circuit board,
(b) an aligned series of temperature sensing elements carried by the exposed surface of said circuit board and adapted to be placed in linear alignment with the embedded shunt for progressively sensing a temperature change in the fluid as its flows through the shunt,
(c) a pair of temperature sensitive elements carried by said circuit board to either side of said aligned series of temperature sensitive elements for sensing the temperature of an adjacent area of the embedded shunt so as to establish a reference temperature source,
(d) conduit means connecting all of said temperature sensing elements to an information gathering and analysis source, and
(e) said information gathering and analysis source registering and indicating the progressive change in temperature of the fluid as it flows through the embedded shunt and for calculating the rate of flow by said progressive temperature variances.

4,548,517

DEVICE FOR MEASURING THE TEMPERATURE IN A DUST CARRYING GAS STREAM

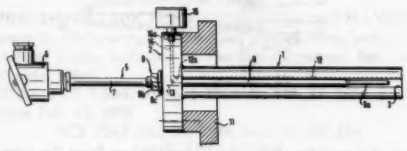
Harry Kampmann, Lünen, Fed. Rep. of Germany, assignor to Steag AG, Essen, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,525

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301886

Int. Cl.⁴ G01K *1/08, 13/02*

U.S. Cl. 374—143 **5 Claims**



1. In a device for measuring the temperature in a dust carrying gas stream having a temperature probe and a dust deflecting rod at least partially enclosing the probe in a recessed portion of the rod to shield the probe from the dust and means for mounting the temperature probe and the deflecting rod within the gas stream substantially transversely to the flow direction of the gas stream; the improvement in which within the deflecting rod at least one channel filled with fluid under pressure extends longitudinally of the rod and substantially parallel to the temperature probe and in spaced relation to the temperature probe, which channel is with respect to the flow direction of the gas stream a predetermined distance in front of the temperature probe and is connected to a pressure sensor to sense a drop of the pressure in the channel.

4,548,518

ISOSTATIC DEVICE TO PROVIDE ROLLING AND SUPPORT WITH REVOLVABLE BODIES, SUCH AS A ROTATABLE RING

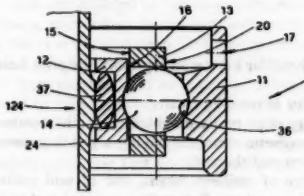
Stefano Ravinale, Sesto S. Giovanni, and Vittorio Vernocchi, Imola, both of Italy, assignors to Officine Savio SpA, Pordenone and Fag Italiana SpA, Naples, both of, Italy

Filed Dec. 20, 1983, Ser. No. 563,565

Claims priority, application Italy, Dec. 23, 1982, 83506 A/82

Int. Cl.⁴ F16C *19/04, 33/10, 33/58;* **D01H** *7/56*

U.S. Cl. 384—490 **15 Claims**



1. An isostatic bearing to provide rolling and support with revolvable bodies comprising

an inner ring,

an outer ring,

a cage, and

three revolvable bodies fitted substantially at angles of one hundred and twenty degrees from each other, wherein said revolvable bodies are kept in position by said cage, the mean circumference of which is offset in relation to the median circumference of rolling of said revolvable bodies, and one of said inner and outer rings is substantially stiff and the other of said inner and outer rings is resilient with a suitable degree of contact with said revolvable bodies so that, after being fitted, the resilient ring takes up a three-lobed conformation, thus providing a pre-set pre-load for said revolvable bodies.

4,548,519

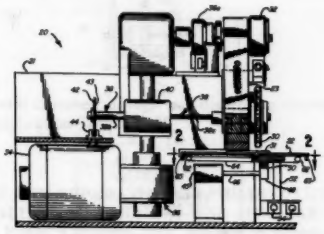
MARKING MACHINE CONTROL SYSTEM

Jeffrey L. Schroeder, Lake Zurich, Ill., assignor to Product Identification Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 183,175, Sep. 2, 1980, abandoned. This application Jun. 15, 1983, Ser. No. 504,721

Int. Cl.⁴ B41J *5/30*

U.S. Cl. 400—61 **14 Claims**



1. A control system for a marking machine of the type having:

a marking member carrying a plurality of marking symbols,

means for moving said marking member to sequentially locate said marking symbols at a marking location,

table means for supporting a workpiece at the marking location,

means for moving said table means and the workpiece supported thereby past said marking location to position successive portions of said workpiece at said marking location, and

means for momentarily displacing said marking member into engagement with a workpiece to effect marking thereof with said selected one of said symbols on said marking member located at said marking location;

said control system comprising:

manually actuatable keyboard means for alternatively selecting one of said marking symbols and one of a plurality of control codes and for producing an output representative of said selected symbol or said selected control code;

means responsive to said output for identifying said output as representative of a symbol or a control code and for determining whether said selected symbol is a symbol on said marking member;

means normally responsive to the identification of said output as a symbol on said marking member for initiating energization of said marking member moving means to move said marking member to locate said selected symbol at said marking location and for initiating energization of said marking member displacing means to effect said momentary displacement of said marking member and the resulting marking of said workpiece;

means responsive to the termination of each energization of said marking member displacing means for energizing said table moving means to increment said table means to position a new portion of said workpiece at said marking location;

manually settable switch means for selecting the distance said table means is to be moved during each of said table increments;

means responsive to the setting of said manually settable switch means for causing said table moving means to increment said table means a distance corresponding to the setting of said switch means; and

means responsive to the identification of said output as a

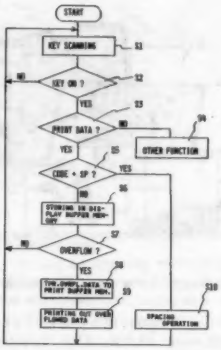
control code for initiating one of a plurality of control operations corresponding thereto.

4,548,520

ELECTRONIC TYPEWRITER

Hideo Ueno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 10, 1984, Ser. No. 598,897
Claims priority, application Japan, Apr. 12, 1983, 58-64996
Int. Cl.[4] B41J *5/44*; G06K *3/00*
U.S. Cl. 400—63 **5 Claims**



1. An electronic typewriter comprising

a printer having a print head shiftable along a printing line of a recording sheet;

a driving unit for shifting said print head by a space corresponding to one character, in each printing line;

a keyboard provided with an arrangement of character keys, a space key, a code key, and function keys, to provide code data corresponding to said keys;

memory means for sequentially storing data entered from said keyboard;

means responsive to actuation of said code key to prohibit entry of data into said memory means while said code key is actuated;

a display unit for displaying data stored in said memory means;

control means for controlling said printer to print out sequentially on said recording paper only data overflowed from said display unit, upon entry of new data ; and

shifting means, under the combined control of said control means, said code key and said space key, for operating only said driving unit to selectively shift said print head by a space in the character feed direction without any data being entered into said memory means, in response to simultaneous operation of said code key and said space key and after entry operation has started.

4,548,521

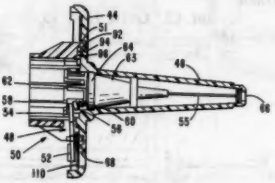
DOT MATRIX PRINT HEAD

Robert L. Wirth, Ithaca, and Hillis L. Wilson, Groton, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1983, Ser. No. 559,993
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **20 Claims**

1. In a wire matrix print head including a mounting plate having a plurality of electromagnets supported therefrom in a circular arrangement, an annular member and a nose portion integral therewith for housing a plurality of wires, and a plurality of armatures operably associated with the electromagnets and pivotable thereby for driving the wires from a non-printing to a printing position, the improvement comprising a

unitary member positioned centrally of said electromagnets and having projecting portions at one end of the unitary member formed to fit each of the armatures at a reduced portion thereof for positioning each of the armatures in relation to a respective electromagnet and having end portions engageable with the mounting plate and with the annular member for spacing the mounting plate and the



annular member in fixed relationship one from the other, and

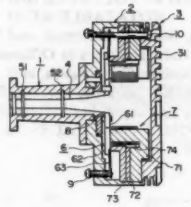
means having individual resilient portions for retaining each of the armatures in position relative to said unitary member and for biasing each of the armatures against its respective electromagnet.

4,548,522

PRINT HEAD FOR A DOT MATRIX PRINTER

Mineo Harada; Tetuzi Simojyo, both of Owariasahi, and Kaname Furuya, Kasugai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,360
Claims priority, application Japan, Aug. 27, 1982, 57-147635
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **14 Claims**



1.

A print head for a dot matrix printer, the print head comprising:

a plurality of printing means;

a plurality of pivotally mounted magnetic members, each of said magnetic members having a printing means secured to a first end thereof;

a plurality of resilient means, one of said resilient means being secured at a first end to a second end of the respective magnetic members, and a bore means is provided in a second end of said resilient means;

a plurality of permanent magnets for respectively attracting said magnetic members;

yoke means mounted on each of said permanent magnets, said yoke means including a pivoting fulcrum means on a surface thereof facing the magnetic member for enabling the pivotal mounting of the respective magnetic members;

a plurality of electromagnetic means for cancelling an attraction force generated by said permanent magnets so as to enable a pivoting of said magnetic members; and

pressing means respectively associated with said resilient means and having a curved head portion adapted to be brought into contact with said bore means with a prede-

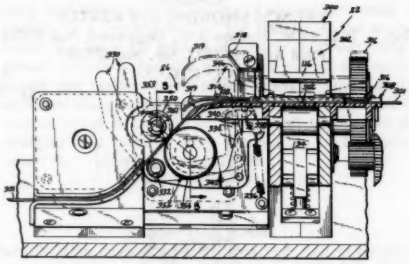
termined degree of freedom to press the second end of each of said resilient means in a predetermined direction so as to enable a distance between the pivoting fulcrum means and a contact point between the curved head portion and said bore means to be varied in accordance with an amount of pivotal movement of the magnetic member.

4,548,523

PRECISION TAPE FEED AND GUIDE MECHANISM

Thomas K. McGourty, and Lawrence F. McGourty, both of Pas Robles, Calif., assignors to Varitronic Systems, Inc., Eden Prairie, Minn.

PCT No. PCT/US84/00096, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984
PCT Filed Jan. 20, 1984, Ser. No. 587,184
Int. Cl.⁴ B41J *13/03*
U.S. Cl. 400—617 **10 Claims**



5. A tape feed mechanism for incrementally feeding an image carrying tape through a printing station comprising:

a stationary guide member affixed to a support having a longitudinal recess sized to receive said tape, said guide member beng positioned in the printing station,

a second guide member being pivotally mounted adjacent said stationary guide and having hold-down fingers operable to overlie the tape when it is in said recess and to be pivotally liftable from the tape,

a first roller aligned to advance the tape, a second roller in parallel with and adjacent to said first roller, means releasably biasing said rollers in contact with each other to engage the tape therebetween, said biasing means including lever means for lifting said fingers of said second guide member from the tape, said lever means including a pivot connected to said support, first and second portions on either side of the pivot, said first portion being operatively connected to the second guide and being aligned to lift said fingers when said first portion is actuated.

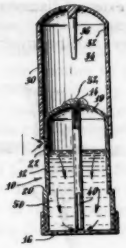
4,548,524

DISPENSING PACKAGE WITH APPLICATOR SURFACE

Richard H. Seager, Mystic, Conn., assignor to Calumet Manufacturing Co., East Orange, N.J.

Filed Jul. 22, 1982, Ser. No. 400,758
Int. Cl.⁴ A45D *34/00*; A46B *11/02*
U.S. Cl. 401—187 **17 Claims**

1. A dispensing package for a flowable product comprising: means forming a chamber having a dispensing opening in an applicator surface on said package; a conduit extending from said dispensing opening into the interior of said chamber; and a cover overlying said opening and closely fitted to the outer wall of said chamber whereby removing said cover causes



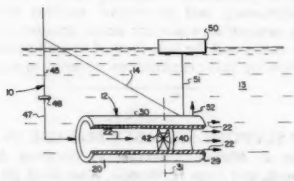
flow from said chamber through said dispensing opening and onto said application surface.

4,548,525

METHOD AND APPARATUS FOR PRE-DILUTION OF DRILLING MUD SLURRY AND THE LIKE

William F. Priebe, Carrollton, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 13, 1982, Ser. No. 449,020
Int. Cl.⁴ E02B *13/00*; E21B *21/06*; B63H *1/06*
U.S. Cl. 405—52 **17 Claims**



1. Apparatus for pre-dilution of a fluid prior to free discharge thereof into a receiving body of water comprising:

(a) an open-ended conduit;

(b) means for positioning said conduit so that both ends thereof lie completely submerged beneath the surface of said body of water;

(c) a fluid line for delivering a stream of said fluid under pressure to within one end of said conduit;

(d) a nozzle terminating said fluid line within said one end for expelling said fluid stream in the form of an expanding fluid jet directed along the longitudinal axis of said conduit toward the opposite end thereof, said fluid line and nozzle being so located with respect to the wall of said conduit as to leave a generally annular space therebetween to thereby cause entrainment in said fluid jet of a quantity of the surrounding water.

4,548,526

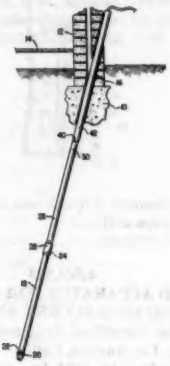
PILING METHOD

Roger A. Bullivant, Burton-on-Trent, England, assignor to Roger Bullivant Inc., Grand Prairie, Tex.

Filed Mar. 7, 1983, Ser. No. 472,832
Claims priority, application United Kingdom, Mar. 6, 1982, 8206655
Int. Cl.⁴ E02D *27/48*
U.S. Cl. 405—233 **11 Claims**

1. A method of providing a pile for a building comprising forming a passage through a foundation as it is being formed, driving a first pile casing section through said passage into the ground beneath the foundation with a percussive machine located at or near floor or ground level of the building, apply-

ing to the end of the first pile casing section a further pile casing section and driving the composite pile casing into the ground by a percussive machine located no lower than the floor or ground level of the building, fitting a percussive machine having a maximum external diameter no greater than the maximum external diameter of the foundation passage and driving said casing further into the ground with said further



percussive machine following the casing into the ground, completing said further driving operation before said percussive machine penetrates completely below floor or ground level, withdrawing said percussive machine and thereafter inserting a cementitious mixture under pressure into the composite pile casing and the hole formed by said percussive member and allowing said cementitious material to set.

4,548,527

ROOF SUPPORT SUITABLE FOR USE IN MINES

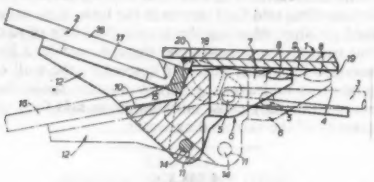
Christopher J. Bishop, Tewkesbury; Geoffrey M. Cumner, Brockworth, and John H. Waters, Knutsford, all of England, assignors to Dowty Mining Equipment Limited, England

Continuation-in-part of Ser. No. 426,686, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 288,311, Jul. 30, 1981, abandoned. This application Jun. 21, 1984, Ser. No. 622,844

Claims priority, application United Kingdom, Aug. 6, 1980, 8025566

Int. Cl.[4] E21D *15/14*

U.S. Cl. 405—294 **4 Claims**



1. A roof support, suitable for use in mines, comprising a main roof-supporting structure having an abutment at one end thereof, a cantilever carried by said structure, an actuator, one part of which is connected to said structure, and a link member through the intermediary of which another part of said actuator is connected to a rear end portion of the cantilever for moving the cantilever from a retracted position with respect to said structure to a fully extended roof-engaging position, and vice versa, said link member being pivotally connected to said rear end portion of the cantilever and having an upstanding formation which slidingly engages the undersurface of a part of said main roof-supporting structure, said rear end portion of the cantilever having formed integrally therewith a projection extending therefrom and engageable with said abutment when the cantilever is fully extended, which projection is part circular in cross-sectional shape, and said abutment forming a seating having a matching part circular cross-sectional shape so that said projection and said abutment prevent further forward movement of said cantilever and together form a pivot means about which said cantilever can then be tilted with respect to said structure by said actuator, said link member being free to continue to slide with respect to said structure after said pivot means has formed, said continued movement of said link member serving to tilt said cantilever, wherein said link member is connected to a downward projection on said cantilever which is positioned immediately below said projection of part circular cross-sectional shape, and wherein said rear end portion of the cantilever has two of said projections of part circular cross-sectional shape extending therefrom by which it is slidingly supported and guided, said projections of part circular cross-sectional shape engaging recesses provided at the sides of a channel formed on the underside of said structure.

4,548,528

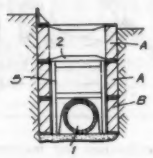
TRENCH SHORING APPARATUS

Noel G. Bell, 52 W. Hudson Ave., Englewood, N.J. 07631

Filed Apr. 18, 1983, Ser. No. 459,395

Int. Cl.[4] E21D *5/12*

U.S. Cl. 405—283 **13 Claims**



1. An apparatus which shores the walls of a trench including those of the sloping part and can travel along the trench by its own power and support its weight by the friction of the earth on its sides, the apparatus comprising longitudinal panels which line the walls of the trench, each panel consisting of a frame which supports an endless crawler track, with vertical treads, that travels longitudinally around the frame, the frame having a cap and a still that together with the crawler track treads totally enclose the panel and prevent earth entering it, the sill of each panel being adapted to fit the cap of the panel below it and prevent entry of earth between them, and the panels being supported by braces across the trench between the caps, and between the sills, of opposite panels.

4,548,529

PROCESS FOR TRANSPORTING PARTICULATE MATERIAL FROM A LOW PRESSURE ZONE TO A GAS-CONTAINING ELEVATED PRESSURE ZONE

Maarten J. van der Burgt, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 13, 1984, Ser. No. 579,738

Claims priority, application Netherlands, Feb. 14, 1983, 8300554

Int. Cl.[4] B65G *53/44, 53/48*

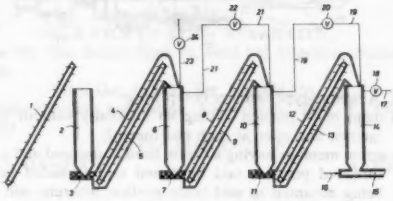
U.S. Cl. 406—53 **14 Claims**

1. A process for transporting particulate material from a low pressure zone to a gas-containing elevated pressure zone comprising

passing particulate material from said low pressure zone to the top of a first gas-containing vertically oblong vessel;

passing said material by gravity as a moving bed from the top of the first vessel to the bottom of the vessel;

passing said material from the bottom of the first vessel to the top of a second gas-containing vessel, the gas at the bottom of the first vessel being at greater pressure than the gas at the top of the first vessel, the gas pressure at the top of the second vessel being the same as the gas pressure at the bottom of the first vessel, and said material being passed in such quantity and at such rate that gas does not escape from the bottom of the first vessel to the top of the first vessel;



passing said material from the top of the second vessel by gravity as a moving bed to the bottom of the second vessel, the gas at the bottom of the second vessel being at greater pressure than the gas at the top of the second vessel, said material being passed in such quantity and at such rate that gas does not escape from the bottom of the second vessel to the top of the second vessel, and discharging said material from the bottom of the second vessel to an elevated pressure zone.

4,548,530

REBORING TOOL

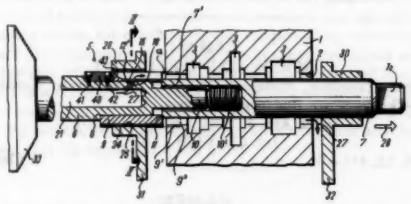
Richard Weiblen, Münsingen-Dottingen, Fed. Rep. of Germany, assignor to TBT Tiefbohrtechnik GmbH & Co. KG, Dettingen, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,135

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307458

Int. Cl.[4] B23D *19/10*

U.S. Cl. 408—79 **4 Claims**



1. A boring tool, particularly a reboring tool for enlarging the bores of workpieces, comprising a rotatably driven carrier including coaxial first and second threadedly connected sparable rotary shanks movable axially between retracted and extended positions, said first shank being located ahead of said second shank, as considered in the direction of axial movement of said shanks to said extended position, and said first and second shanks respectively having spaced-apart first and second abutments which face each other; the second shank being provided with an interior channel for supply of a lubricant and cooling fluid medium through openings at the forward end of the shank to the boring area; said first shank extending through the bore in the workpiece to be enlarged and said first shank further having such a diameter to allow passage of the said fluid medium through the space between the first shank and the bore such as to allow the fluid to leave the space at the end of the bore which is opposite to the one, at which the cutter is positioned at the beginnung of the reboring process; an annular cutter surrounding said carrier and disposed between and contacting said abutments, cutting edges at its front face end and further having centering means; a first sleeve rotatably and axially movably receiving said first shank; and a second sleeve rotatably and axially movably receiving said centering means in the retracted positions of said shanks, said sleeves being spaced apart from one another so as to provide room for a workpiece therebetween whereby the first shank extends through the bore of such workpiece in the retracted positions of said shanks and the cutting edges begin to penetrate into the bore of the workpiece in response to movement of said shanks from said retracted positions, the first sleeve being placed at such a distance from the workpiece that the said fluid medium can leave the bore in the workpiece at the end of the bore, which is neighboring the first sleeve.

4,548,531

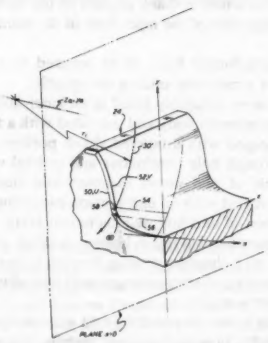
METHOD FOR CHAMFERING THE EDGES OF GEAR TEETH

Leon H. Seitelman, Glastonbury, and Edward J. Kaveckas, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1983, Ser. No. 491,126

Int. Cl.[4] B23F *17/00*

U.S. Cl. 409—9 **5 Claims**

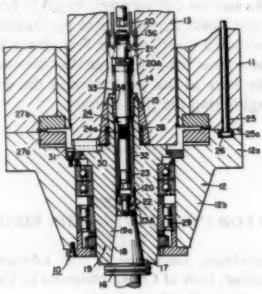


1. The method of producing on the edges of the teeth of a gear a chamfer having desired maximum and minimum edge-to-edge width dimensions along its length, where the edge of each gear tooth is formed by the intersection of a tooth side generally lying in an x-y plane and a tooth flank generally running perpendicular thereto in a z axis direction, while using a cutting tool which has circular motion about an axis perpendicular to the y-z plane, which comprises selecting a first tool profile and determining s-dimensions at a multiplicity of points along the length of the chamfer which would be produced by the first tool profile, where the s-dimensions are the distances across the chamfer from an edge thereof to the nearest point on the opposing edge thereof; comparing the s-dimensions to the chamfer width desired at each of the said multiplicity of points; iteratively selecting further tool profiles each of which is different from the prior tool profile, and determining for each the s-dimensions at a multiplicity of points along the length of the chamfer which would be produced and comparing them to the chamfer widths desired, until a final tool profile is determined, which profile provides s-dimensions falling within the range of the desired minimum and maximum chamfer widths; making a tool having substantially said final profile, and; chamfering the teeth with the tool so made.

4,548,532
ATTACHMENTS FOR FITTING TOOLS TO SPINDLES

Koya Watanabe; Katuo Yamazaki, both of Numazu, and Sadaji Hayama, Mishima, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 481,078
Claims priority, application Japan, Apr. 10, 1982, 57-52269
Int. Cl.[4] B23C *5/26*
U.S. Cl. 409—233 1 Claim



1. An attachment adapted to fit a tool to a hollow spindle of machine tool in which a shank portion of the tool has a taper size smaller than that of the taper hole of the spindle comprising:

a hollow attachment body to be secured to a lower end surface of a ram surrounding the spindle;

a sleeve member rotatably fitted in an inner hollow portion of said attachment body and provided with a tapered hole to be engaged with a tapered shank portion of said tool and a through hole continuous and coaxial with said tapered hole of said sleeve member, said sleeve member being provided with an end portion extending into a hollow portion of said hollow attachment body;

a tapered member having a hollow conical configuration disposed on a shoulder portion formed at one end of said sleeve member so as to surround said extending portion of said sleeve member;

a first spring means disposed on said shoulder portion so as to outwardly urge said tapered member into the tapered hole of said attachment body;

a threaded member threaded into said end portion of said sleeve, said threaded member having a through hole corresponding to said through hole in said sleeve;

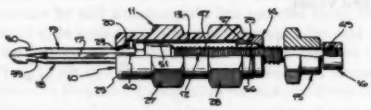
an arbor assembly disposed in said through hole of said sleeve member, said through hole in said threaded member and said hollow member of said attachment body and adapted to secure the tool to the spindle of the machine tool, said arbor assembly comprising a stud arbor, a pull-stud provided at one end of said arbor assembly in said hollow portion of the attachment body to be engaged with a collet chuck axially movably supported on said spindle and a collet chuck provided at the other end of said arbor assembly to be engaged with a pull-stud of the tool inserted into said sleeve member, said pull-stud of said arbor assembly being held in the hollow portion of said attachment body of the spindle; and

a spring means provided in said hollow portion of said hollow attachment body and engaging at one end of said pull-stud and engaging at the other end of said threaded member so as to outwardly urge said pull-stud of said arbor assembly whereby said pull-stud of said arbor assembly is held in the hollow portion of said attachment body of the spindle.

4,548,533
WEDGE-TYPE FASTENER

John D. Pratt, Rancho Cucamonga, Calif., assignor to Monogram Industries, Inc., Providence, R.I.

Filed Apr. 20, 1984, Ser. No. 602,356
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—55 10 Claims



1. A wedge-type fastener comprising:

a main body portion having an internally smooth walled interior and open at each end thereof;

a screw member having a screw head at one end and a main threaded portion, said head and said threaded portion being mounted in said body portion wherein said main threaded portion is adapted, in a first position, to be substantially contained within said main body portion, and, in a second position, have a substantial portion of said main threaded portion extend out of one of the open ends of said body portion;

a pair of spaced wire elements fixedly mounted at one end in the head of said screw member extending out of the other open end of said main body portion;

a spacer loosely disposed between said wire members and having one end extending out of said other open end of said main body portion and its other end retained with said body position between said screw head and said other open end of said main body portion;

an opened ended tubing mounted internally of said main body portion having flange means disposed between said other end of said spacer and said screw head, said screw head being keyed to the inner wall of said tubing for rotation therewith and similarly keyed to the inner wall of said main body portion for rotation therewith;

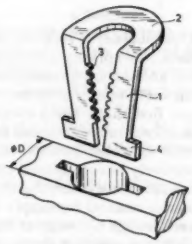
an end cap closing off said one end of said main body portion having the main threaded portion of said screw member extending therethrough; and

a nut threaded on the portion of said main threaded portion extending out of said main body portion.

4,548,534
SCREW FIXING ELEMENT

Gábor Trummer, Budapest, Hungary, assignor to Kontakta Alkatreszgyar, Budapest, Hungary

Filed Apr. 1, 1983, Ser. No. 481,276
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—61 2 Claims



1. A fixing element for securing threaded fasteners in a through bore formed in a body of synthetic material comprising a generally horseshoe shaped body formed of planar sheet metal, said body having a pair of legs lying in a common plane

and joined at one end by an arcuate web, said web being bent to lie in a plane perpendicular to the plane of said legs, each of said legs having a flange at each of its free ends extending outwardly within the plane of the body, and a series of teeth along the inner edges thereof for receiving and meshing with the threads of the screw inserted therebetween said legs being of such length as to span said hole and to permit said flanges to engage over one end of said hole and said bent arcuate web to ensure over the opposite end of said hole.

4,548,535

BALE PICK-UP CLAW APPARATUS

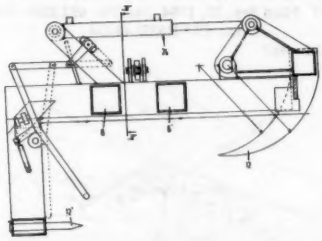
Willem van Die, Buitensingel 46, 9883 SH Oldehove, Netherlands

Filed Dec. 6, 1983, Ser. No. 558,636

Claims priority, application Netherlands, Dec. 7, 1982, 8204742

Int. Cl.⁴ A01D *87/12*

U.S. Cl. 414—111 **3 Claims**



1. A pick-up apparatus connectible to a farm vehicle for handling baled material, in particular baled roughage, comprising a carrier beam which, when the apparatus is coupled to the vehicle, is at right angles to the direction of travel of the vehicle, and which carrier beam is connected to at least two hydraulically operated claw members, characterized in that each said claw member includes an upper curved claw portion adapted for movement in the vertical plane and a coacting lower straight and immovable claw portion, the claw members are connected to the carrier beam substantially perpendicular thereto and substantially parallel to one another, said apparatus including means for effecting lateral reciprocating movement of said claw members, the lateral and vertical movement and the position of said upper claw portion relative to said lower claw portion being chosen such that the pack of baled material to be picked up by said pick-up apparatus is subjected to an upward and backward movement toward the vehicle attached to said pick-up apparatus when lifted.

4,548,536

WORKING APPARATUS WITH TRACK FOLLOWING MOTION

Tokio Shiga, Okazaki, and Keiichi Saida, Tokoname, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha and Kabushiki Kaisha Chubu Netsuren Kenkyusho, both of Kariya, Japan

Filed Nov. 18, 1982, Ser. No. 442,659

Claims priority, application Japan, Nov. 27, 1981, 56-191421; Dec. 11, 1981, 56-200681; Apr. 14, 1982, 57-63116

Int. Cl.⁴ B65G *47/06, 39/08*

U.S. Cl. 414—225 **29 Claims**

1. A working apparatus comprising in combination:

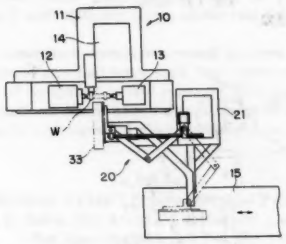
a fixed base;

a support and transfer mechanism operably mounted on said fixed base and having a first movable member horizontally movable relative to said fixed base and a second movable member horizontally movable relative to said fixed base and said first movable member;

a head support provided on and carried by said second movable member;

a working head mounted on said head support means for performing work;

track means provided in a fixed relation with said fixed base and horizontally extending for enabling said working head to be presented selectively to at least two service positions;



follower means carried by said head support and horizontally movable along said track means bodily with said head support; and

drive means for eanbling said follower means to move along said track means so as to thereby present said working head selectively to said at least two service positions.

4,548,537

APPARATUS FOR TAKING UP ROD TYPE MATERIALS

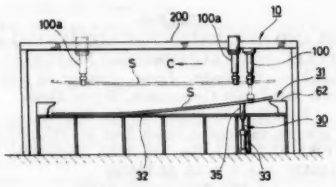
Hiroshi Kubotera; Kenji Ogawa, and Kenji Hatakeyama, all of Ichihara, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd. and Kajima Corporation, both of Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,331

Claims priority, application Japan, May 17, 1982, 57-81497

Int. Cl.⁴ B65G *47/06; B66F 11/00*

U.S. Cl. 414—276 **6 Claims**



1. An apparatus for taking up rod type bodies, comprising at least one take-up means, which is provided on a rack used to temporarily store a plurality of rod type bodies thereon, and which is adapted to separate a certain rod type body from the plural rod type bodies, at least one clamp means provided in opposition to said take-up means and adapted to fix therein said rod type body separated by said take-up means, and at least one means for slidably grasping said rod type body fixed in said clamp means, and means for moving said grasping means in the lengthwise direction of said rack.

4,548,538

MOBILE APPARATUS FOR MIXING AND LOADING CONCRETE

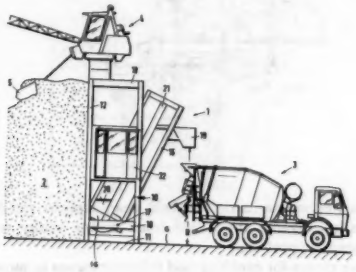
Gerhard Brüder, Rastatt, and Horst Pippinger, Karlsruhe, both of Fed. Rep. of Germany, assignors to Elba-Werk Maschinen-Gesellschaft mbH & Co., Ettingen, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,043

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149130; Sep. 8, 1982, 3233292

Int. Cl.[4] B28C *9/04*

U.S. Cl. 414—332 **6 Claims**



1. An apparatus for preparing bulk material and loading same into a truck, the apparatus comprising:

an elongated and generally parallepipedal first frame having a first end and elongated sides;

a horizontal pivot at the first end of the first frame;

an elongated and generally parallepipedal second frame having a first end pivoted at the pivot on the first end of the first frame and a second end, the frames being relatively pivotally displaceable between a transport position with the second frame horizontal and lying substantially within the first frame which also has said elongated sides horizontal and a use position with the first frame standing via its first end on the ground and with said elongated sides vertical, with the two frames extending at an angle to each other, and with the second end of the second frame spaced horizontally from the first frame above the ground by a distance equal to the loading height of the truck;

a rail extending between the ends of the second frame;

a bucket displaceable along the rail between the ends of the second frame; and

means at the first end of the first frame for filling the bucket, when same is at the first end, with bulk material.

4,548,539

METHOD AND APPARATUS FOR UNPACKING A BOX PACKED WITH COMPRESSED MATERIAL

Ayuji Nagashino, Hiratsuka, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,528

Claims priority, application Japan, Dec. 23, 1982, 57-224971; Dec. 23, 1982, 57-224972; Dec. 23, 1982, 57-224974; Aug. 9, 1983, 58-144430; Aug. 9, 1983, 58-144431

Int. Cl.[4] B65G *65/30, 65/34*

U.S. Cl. 414—412 **11 Claims**

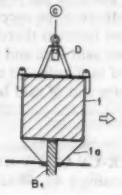
1. A method of unpacking a box packed with compressed material comprising the steps of

placing a box packed with compressed material and having flaps at a bottom thereof on a bed having an opening therein;

lifting said box from said bed to allow said compressed material to start descending from within the box thereby causing said flaps to open gradually;

raising a support member from said opening through said opened flaps to support said compressed material from below;

continuing said lifting of the box until the flaps completely open; and



lowering said support member to place said compressed material on said bed.

4,548,540

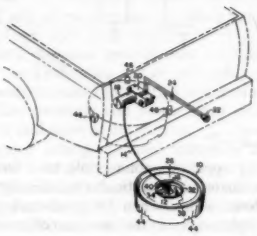
SPARE TIRE SECURING APPARATUS

Don C. Renfro, 5508 Ivy Hill, Arlington, Tex. 76016

Filed Sep. 20, 1984, Ser. No. 652,280

Int. Cl.[4] B62D *43/04*

U.S. Cl. 414—463 **1 Claim**



1. An apparatus for securing a spare tire under the bed of a pickup truck, comprising:

a flexible enclosure formed from a hollow right circular cylinder having a height greater than the thickness of the spare tire, said cylinder sealed on one end thereof with a recess formed in said one end extending into the interior of said cylinder;

a rigid plate disposed on the surface of said recess and perpendicular to the access of said cylinder, said recess and said rigid plate for receiving the rim of the spare tire are dimensioned such that a space is formed between the side walls of the spare tire and said closed end, said space for storage;

locating lugs disposed in said rigid plate and extending upwards therefrom for cooperation with lug holes in the rim of the spare tire;

an eyebolt disposed in the rigid plate in the center thereof for extending through the center of the rim of the spare tire;

a cable;

a detachable clamp connected to one end of said cable for insertion through the eyebolt, said clamp allowing removal of the end of said cable from said eyebolt such that the spare tire can be pulled out of said enclosure over said eyebolt;

a motor drive package mounted on the bottom of the pickup bed truck;

a winch attached to said motor drive package and activated thereby, said winch having the other end of said cable attached thereto for extension and retraction thereof;

said motor drive package operating in one direction to retract said cable with said winch and in the opposite direction to extend said cable from said winch;

a secured key switch for activating said motor drive package, said key switch preventing access to the operation of said motor drive package without a corresponding key;

first, second and third shock absorbing members mounted on the underside of the pickup truck bed and disposed proximate the periphery of said enclosure when said cable is fully retracted by said winch;

said shock absorbing members having a beveled surface tapering downward and outwardly from the pickup truck bed such that the upper peripheral edge of said enclosure contacts the tapered surface to prevent contact of said enclosure with the underside of the pickup truck bed; and

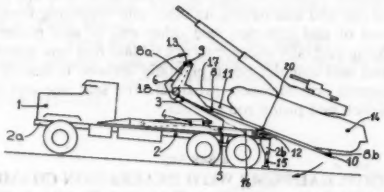
integral grips formed in the lower peripheral edge of said enclosure to allow an operator to grasp the lower peripheral edge to laterally move said enclosure away from the pickup truck when said cable is extended from said winch.

4,548,541

METHOD AND APPARATUS FOR UNLOADING A PIECE OF EQUIPMENT PLACED ON A CARRYING VEHICLE

Antoine Corompt, Loire, France, assignor to Bennes Marrel, France

Filed Jul. 29, 1983, Ser. No. 517,290
Int. Cl.⁴ B60P *1/30*
U.S. Cl. 414—479 **19 Claims**



8. Apparatus for unloading a piece of equipment from a lorry having a forward end and a rearward end opposite said forward end, said lorry defining a forward direction from said rearward end toward said forward end and a rearward direction from said forward end toward said rearward end, said piece of equipment having propulsion means selectively operable to displace said piece of equipment, said apparatus comprising:

an arm having a first end and a second end opposite said first end, said first end being pivotally interconnected with said lorry at a first predetermined location remote from said rearward end, said arm being pivotable between a lowered position wherein said second end extends generally in said forward direction from said first end and a raised position wherein said second end is elevated from said first position;

first resistance means interposed said arm and said lorry and exerting a first biasing resistance inhibiting the pivoting motion of said arm relative to said lorry;

a jib having a first end and a second end opposite said first end, said first end being telescopically interconnected with said second end of said arm such as to permit telescopic displacement of said jib relative to said arm when in said forward and said rearward directions when said arm is in said lowered position;

second resistance means interposed said arm and said jib and exerting a second biasing resistance inhibiting the pivoting motion of said jib relative to said arm;

platform means having a forward end and a rearward end, said forward end of said platform means being hingedly interconnected with said second end of said jib, said rearward end of said platform means extending in said rearward direction from said forward end thereof, said piece of equipment being mountable on said platform means, said platform means being displaceable in said first and second directions relative to said lorry by the telescopic displacement of said jib relative to said arm between a forward position wherein said platform means is generally disposed over said lorry and a rearward position wherein a substantial portion of said platform means extends rearwardly from said lorry beyond said rearward end of said lorry;

fulcrum means interposed between said platform means and said rearward end of said lorry when said platform means is in said rearward position, said platform means being pivotable about said fulcrum means in said rearward position as said arm is pivoted relative to said lorry, said first resistance means selectively inhibiting the pivotal movement of said platform means about said fulcrum means; and

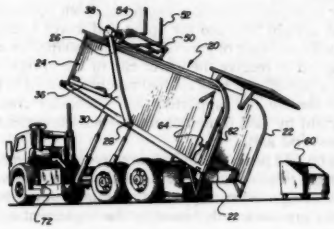
power transmission means interposed between said piece of equipment and said lorry such that displacement of said piece of equipment in said rearward direction relative to said platform means causes displacement of said platform means in said rearward direction relative to said lorry.

4,548,542

DISPOSAL VEHICLE LOADING APPARATUS

Raymond E. Reese, 322 Ave. 17, Los Angeles, Calif. 90031

Filed Apr. 30, 1984, Ser. No. 605,146
Int. Cl.⁴ B65F *3/04*
U.S. Cl. 414—549 **8 Claims**



1. A top loading disposal vehicle having channel shaped tracks on the top of the sides and vertical rear portions of a bed comprising:

a. a pair of lifting arms having a first and second end with a fulcrum bracket disposed closer to the first end than the second end;

b. a pair of lifting arm hydraulic cylinders having a first and second end, the first end pivotally attached to said fulcrum bracket, and the second end connected to said disposal vehicle bed;

c. a pair of arm travelers slideably mounted upon said lifting arms having the freedom to move from said fulcrum bracket to the second end of said arm;

d. a bucket carriage rotatably joined on each end to said arm travelers and slideably connected to said channel shaped tracks on the top and rear of the disposal vehicle having a body with a pair of lifting forks distending angularly therefrom;

e. a pair of bucket emptying hydraulic cylinders attached on one end to said carriage body and on the other end to said lifting forks; and,

f. hydraulic pressure means providing the motive force to operate said hydraulic cylinders such that when said forks are positioned near the bottom of said bed, the hydraulic pressure actuates the pair of lifting arm cylinders attached to the lifting arm fulcrum bracket retracting them linearly pulling the lifting arms in an upward and forward direction, the arm travelers being rotatably connected to the bucket carriage follow the contour of the disposal vehicle bed along the vertical rear and top of the sides transporting the lifting forks upward and forward along the top of the bed reaching a desired position where said bucket emptying hydraulic cylinders are hydraulically energized tilting the forks hori-

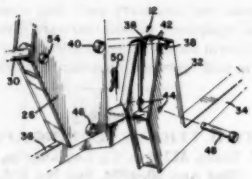
zontally such that the contents of a bucket attached to said forks would be emptied.

4,548,543

QUICK ATTACHMENT DEVICE

John B. Lenertz, Carver County, and Carroll E. Moore, Sibley County, both of Minn., assignors to Farmhand, Inc., Excelsior, Minn.

Filed Mar. 7, 1985, Ser. No. 709,039
Int. Cl.[4] B66C *23/36*
U.S. Cl. 414—686 **6 Claims**



1. In an implement of the type including a frame, an upright connected at the upper end to the frame, and a fixed mounting pedestal adapted for connection to a vehicle, the improvement comprising:

a pair of aligned trunnions extending from opposite sides of said upright between the upper and lower ends thereof;

said pedestal being of generally channel-shaped cross section adapted to receive the lower end of the upright and having a pair of opposing aligned notches formed in the upper end thereof for supporting and vertically cradling said upright by said trunnions for pivotal movement about a transverse axis;

a stop on said pedestal, for limiting pivotal movement of said upright relative to said pedestal about the transverse axis, said upright when supported on said pedestal being normally gravitationally biased by the implement against said stop;

a sleeve extending through opposite sides of said upright between said trunnions and the lower end of said upright, said stop being positioned to engage said sleeve on said upright;

said pedestal including a pair of opposing aligned openings formed therein positioned for registry with said sleeve when said stop and upright are engaged; and

a pin adapted for selective insertion through the openings in said pedestal and said sleeve for locking said upright in fixed position on said pedestal.

4,548,544

ROBOT APPARATUS PARTICULARLY ADAPTED FOR REMOVING AND HANDLING DIE CAST PARTS

William Van Appledorn, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 30, 1982, Ser. No. 454,659
Int. Cl.[4] B21J *13/10*; B65G *65/02*
U.S. Cl. 414—751 **19 Claims**

1. A die cast extractor comprising:

a support portion;

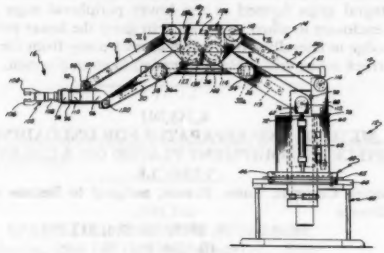
a knee portion;

a claw portion;

first arm means for supporting said knee portion on said support portion, said first arm means including a pair of first arm members and first pivot means for pivotally connecting each of said first arm members to both of said support portion and said knee portion, said first pivot means defining the corners of a first parallelogram;

second arm means for supporting said claw portion on said knee portion, said second arm means including a pair of second arm members and second pivot means for pivotally connecting each of said second arm members to both of said knee portion and said claw portion, said second pivot means defining the corners of a second parallelogram; and

movement means for moving said claw portion linearly relative to said support portion, said movement means including a ram actuator for causing said first and second arm means to be pivoted toward and away from each



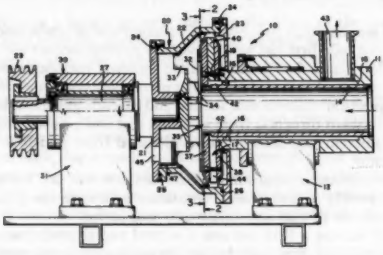
other said ram actuator including a cylinder in which is located a piston having a piston rod secured to said piston at one end and having its other end extending from one end of said cylinder, said other end of said piston rod being pivotally secured to one of said first arm members; and said cylinder being pivotally secured to one of said second arm members proximate the said one end from which said piston rod extends.

4,548,545

CENTRIFUGAL PUMP WITH DEAERATION CHAMBER

Kenneth D. Lewis, Monument, Colo., and Timothy A. Potts, Darien, Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 4, 1983, Ser. No. 481,806
Int. Cl.[4] F04D *17/08, 29/44*
U.S. Cl. 415—90 **8 Claims**



1. A centrifugal fluid pump comprising,

(a) a cylindrical shaped outer housing,

(b) fluid feed means comprising a tubular conduit member concentrically arranged within said cylindrical outer housing and having outer walls spaced from the inner wall surface of said outer housing to provide a fluid outlet passage therebetween,

(c) a stator element comprised of a pair of spaced interconnected cylindrical plates secured to one end of said outer housing,

(d) a rotor casing having a base portion spaced from said stator and having peripheral sidewall portions encompassing the periphery of said stator,

(e) a deaeration chamber provided in said rotor casing between said base portion and said stator,

(f) an impeller secured to an axial hub of said rotor base

portion in alignment with the discharge outlet of said fluid feed conduit member to said deaeration chamber, and spaced a predetermined distance from said stator and fluid discharge outlet to provide a liquid shearing zone within said deaeration chamber,

(g) a plurality of radially extending fluid receiving channel vanes in said stator between said stator plates open at their inner ends thereof to said fluid outlet passage and at the outer ends to the periphery of said rotor impeller,

(h) vent outlets in said rotor base portion, and

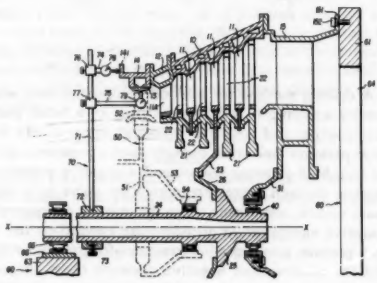
(i) drive means connected to said rotor casing operable to rotate said rotor casing and impeller for discharging fluid from said deaeration chamber to said stator fluid receiving channel vanes while air bubbles separated from said fluid by said impeller are sheared in said shearing zone and air discharged through said vent outlets.

4,548,546

ADJUSTMENT SYSTEM OF CENTERING A TURBOMACHINE WHEEL AND MOUNTED TURBOMACHINE BY WAY OF PERMITTING THE APPLICATION OF SAID SYSTEM

Alain M. J. Lardellier, Melun, France, assignor to S.N.E.C.-M.A., Paris, France

Filed Nov. 4, 1982, Ser. No. 439,212
Claims priority, application France, Nov. 5, 1981, 81 20719
Int. Cl.⁴ F04D *29/04*
U.S. Cl. 415—133 **2 Claims**



1. A turbojet comprising:

a shaft mounted on a plurality of fixed bearings inserted within seats joined to a turbine frame;

at least one high-pressure turbine wheel mounted on said shaft;

a stator ring that surrounds said wheel, wherein said turbine frame further comprises at an upstream end thereof a collar having an assembly flange wherein said stator ring is positioned on said collar;

a support assembly operatively associated with a first fixed bearing of said plurality of fixed bearings which is located downstream closest to said wheel and having a seat; and

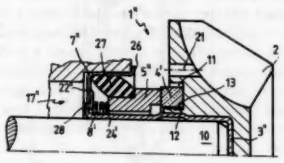
a single eccentric ring mounted on said shaft and having relatively off-centered inner and outer bearing surfaces and which is positioned between said first fixed bearing of said plurality of fixed bearings, located downstream closest to said high pressure wheel and in contact with said inner bearing surface, and said support assembly of said fixed bearing located downstream closest to said high pressure wheel, said support assembly being in contact with said outer bearing surface wherein an outer bearing ring of said first fixed bearing is fixedly attached to said support assembly so as to fix the position of said single eccentric ring.

4,548,547

SEAL ASSEMBLY, PARTICULARLY FOR LIQUID PUMPS

Hans Deuring, Burscheid, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,747
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248074
Int. Cl.⁴ F04D *29/12*; F16J *15/36*
U.S. Cl. 415—170 A **5 Claims**



1. A seal assembly for a rotary machine comprising:

(a) a rotary machine part of a hard rubber-like elastomer having a rotary axis, an axial length and a generally radial end;

(b) an annular recess in said generally radial end of said rotary machine part; said annular recess being defined by radially inner and radially outer concentric annular axial wall portions of said rotary machine part; said radially inner wall portion having a wavy configuration;

(c) a sheet metal hub surrounded by said rotary machine part and being permanently bonded thereto; said sheet metal hub being generally sleeve-shaped having a radial base situated within said rotary machine part and a generally cylindrical wall coaxial with said rotary axis and extending substantially along the entire axial length of said rotary machine part; said hub having a rib; said radially inner wall portion surrounding said hub and being in circumferential contact with said hub, including said rib;

(d) a counter ring being directly received in said annular recess and being generally coaxial with said rotary machine part; said counter ring being in circumferential frictional engagement with said wavy configuration of said radially inner wall portion and surrounding circumferentially a length portion of said hub; said counter ring having a brittle material relative to said rotary machine part; wherein diametral dimensions of said hub, including said rib, and diametral dimensions of said radially inner wall portion being selected such that said rib deforms said radially inner wall portion towards said counter ring; and

(e) a slide ring seal unit being in sliding contact with said counter ring and being generally coaxial with said rotary machine part.

4,548,548

FAN AND HOUSING

Leslie M. Gray, III, Belmont, Mass., assignor to Airflow Research and Manufacturing Corp., Watertown, Mass.

Filed May 23, 1984, Ser. No. 613,958
Int. Cl.⁴ F28F *13/06*
U.S. Cl. 416—189 **13 Claims**

1. In combination, a fan and air-guide housing adapted to support a motor and move air through a heat exchanger, said combination comprising:

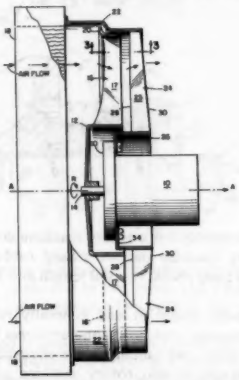
a fan hub connectable to said motor for rotation on a central axis;

a plurality of elongated blades extending radially outwardly from said hub, each of said blades comprising a surface that is pitched with respect to said axis, so that rotation of said hub causes airflow in a direction generally oblique to said axis;

a circumferential band which connects the tips of said blades and extends about said axis concentrically with said hub;

a housing extending downstream from a region radially outward of said band, and

a plurality of plastic elongated stationary members positioned downstream of said fan blades and extending from said housing radially inwardly to a means for supporting said fan motor, each of said members comprising a flow-control surface oblique to said airflow direction, and said



member surfaces being positioned and configured so that, at least at the region of greatest air-flow velocity, the nose-tail line of said surfaces intersects said airflow direction at an angle substantially equal to the angle between said nose-tail line and a line parallel to the fan axis, said member surfaces having a total area of at least 30% of the area of said fan blade surface area,

whereby said flow control surfaces deflect said airflow axially.

4,548,549

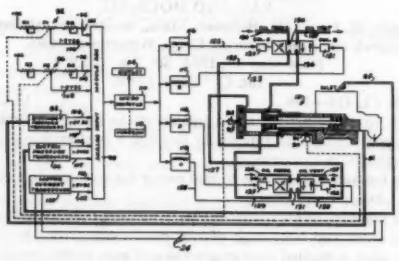
MICRO-PROCESSOR CONTROL OF COMPRESSION RATIO AT FULL LOAD IN A HELICAL SCREW ROTARY COMPRESSOR RESPONSIVE TO COMPRESSOR DRIVE MOTOR CURRENT

David A. Murphy, Chambersburg, Pa., and Peter C. Spellar, Hagerstown, Md., assignors to Frick Company, Waynesboro, Pa.

Division of Ser. No. 659,039, Oct. 10, 1984, Pat. No. 4,519,748, which is a continuation of Ser. No. 453,988, Dec. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,768, Sep. 10, 1982, abandoned. This application Feb. 8, 1985, Ser. No. 699,885

Int. Cl.⁴ F04B *49/06*; F01C *1/10*

U.S. Cl. 417—53 **2 Claims**



1. The method of operating an electric motor driven compressor of the type having meshing helical rotors, means for selectively loading and unloading the compressor, and a slide member mounted for axial movement, the position of which determines the compression ratio, comprising sensing the compressor drive motor current, detecting full load operation, during full load operation moving the slide member incrementally in one direction while the drive motor current is decreasing until the drive motor current begins to increase, moving the slide member incrementally in the other direction while the drive motor current is decreasing, and continuously seeking a null point of said current through the movement of said slide member.

4,548,550

METHOD AND SYSTEM FOR DRIVING BLOOD PUMPING DEVICES

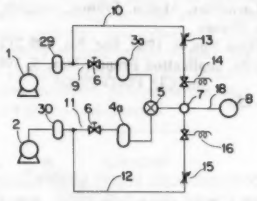
Takashi Tsuji, Fujisawa, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,084

Claims priority, application Japan, May 11, 1983, 58-080686; May 11, 1983, 58-080687; May 11, 1983, 58-080688

Int. Cl.⁴ F04B *43/06*

U.S. Cl. 417—390 **8 Claims**



1. A driving method for a blood pumping device which is driven by applying to a driving portion of a blood pumping device positive and negative pressures alternatively from a positive pressure tank connected through a pressure regulating valve to a high pressure source and a negative pressure tank connected through a pressure regulating valve to a negative pressure source, comprising when the positive pressure of both the positive and negative pressures are exerted on the above driving portion, compensating pressures for pressure drop and rise in the positive and negative pressure tanks are exerted thereon in synchronism therewith without going through the pressure regulating valves.

4,548,551

FLUID DRIVEN RECIPROCATING PUMP CAPABLE OF EITHER SINGLE-ACTION OR DOUBLE-ACTION OPERATION

Alexander Ruttenberg, Haifa, and Alexander Zur, Kfar Bialik, both of Israel, assignors to T.M.B. Fertilizer Pumps Ltd., Haifa, Israel

Filed May 4, 1984, Ser. No. 607,157

Claims priority, application Israel, May 10, 1983, 68647

Int. Cl.⁴ F04B *9/10*

U.S. Cl. 417—393 **17 Claims**

1. A fluid-driven reciprocating pump comprising:

a pair of pumping heads each containing a displaceable member defining a driving chamber and a pumping chamber on opposite sides thereof;

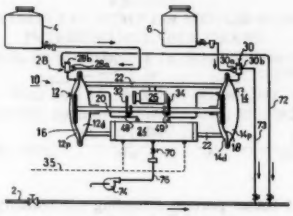
a mechanical connection coupling the two displaceable members for reciprocating together;

means including a main valve and a pilot valve for connecting the driving chamber of at least one of said pumping heads to a source of pressurized fluid and the pumping chamber of said one pumping head to a source of material to be pumped; and means including said main valve and said pilot valve for

connecting the driving chamber of the other pumping head to a source of pressurized fluid;

said main valve including a cylinder, a stem movable in said cylinder, a pair of pistons fixed to said movable stem, a plurality of ports controlled by said pistons, and a diaphragm connected to one end of said stem and closing one end of said cylinder to define a fluid control chamber therein;

said pilot valve including a stem reciprocable by said mechanical connection such that in one position of said two displaceable members the pilot valve applies the source of pressurized fluid to said control chamber of the main valve to move said main valve stem in the direction to connect the driving



chamber of one pumping head to the source of pressurized fluid, whereas in the opposite position of said two displaceable members the pilot valve interrupts the application of the source of pressurized fluid to said control chamber of the main valve;

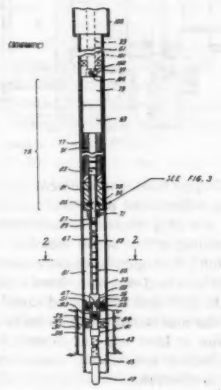
one of said pistons of the main valve having a larger cross-sectional area exposed to the source of pressurized fluid than the other piston of said main valve, such as to move said main valve stem in the opposite direction, to connect the driving chamber of the other pumping head to the source of pressurized fluid, when the pilot valve interrupts the application of the pressurized fluid to said control chamber of the main valve.

4,548,552

DUAL VALVE WELL PUMP INSTALLATION

Daniel R. Holm, 5650 Timbercreek Place Dr., #505, Houston, Tex. 77084

Filed Feb. 17, 1984, Ser. No. 581,500
Int. Cl.[4] F04B *17/04*
U.S. Cl. 417—417 **5 Claims**



1. Apparatus comprising:

a motor pump assembly including a reciprocating motor having a stator and a mover and a pump having a barrel and an imperforate plunger, said barrel being connected to said stator, said mover being connected to said plunger, said stator and mover including electromagnet means cooperable with gravity on the down stroke of the plunger to expel fluid from the pump barrel below the plunger and elevate the fluid when the pump is suitably positioned in a wellbore,

said plunger being mounted for reciprocation within said barrel, said pump including valve means connected to the lower end of the barrel, said valve means including inlet check valve means to admit fluid to the barrel and outlet check valve means to allow fluid to exit the barrel,

said motor pump assembly being mounted within a well, said well including a casing coaxial with the motor and pump, a tailpipe connected to the inlet valve means, there being a fluid passage between the casing and the motor pump assembly, and a packer around the tailpipe sealing between the casing and tailpipe, said outlet valve means communicating the interior of the barrel below the plunger with the interior of the casing exterior to the motor pump assembly on the side of the packer opposite from the tailpipe, the barrel having a single longitudinally extending wall and the exterior of the barrel being at all times in open communication with the interior of the casing above the packer,

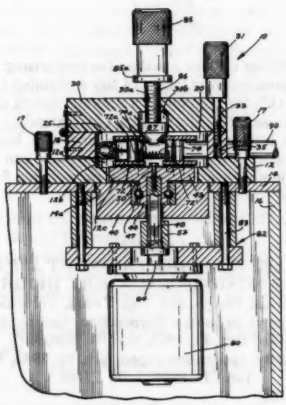
said apparatus including a string of tubing inside said casing at the end of said motor pump assembly opposite from said tailpipe, a second packer around said tubing string sealing between the tubing string and casing, and a standing check valve connected to said tubing string below said second packer to admit fluid from the annulus to the tubing string.

4,548,553

PERISTALTIC PUMP STRUCTURE

Reuben I. Ferster, 2101 Hennepin Ave., Minneapolis, Minn. 55405

Filed Sep. 24, 1984, Ser. No. 653,605
Int. Cl.[4] F04B *43/12, 45/08*
U.S. Cl. 417—477 **5 Claims**



1. A peristaltic pump structure comprising

a base member,

a recess in said base member defining an arcuate path,

a pump assembly disposed within said recess rotatable upon an axis concentric with the axis of said path,

said pump assembly comprising

a circular plate member,

a pair of diametrically opposed pin members upstanding from said plate member,

a pair of elongated plate members respectively having opposite ends pivoted to said pin members,

a pair of rollers being respectively journaled onto said ends of said pair of plate members remote from said first mentioned ends of said pair of plate members,

means yieldingly holding said pair of plate members against separation by pivotal movement at said ends pivoted to said pin members,

a flexible tube disposed through said arcuate path engaged by said rollers,

a cover overlying said base member,

a screw member tapped through said cover aligned with axis of said pump assembly,

a cone journaled onto the end portion of said screw member extending inwardly of said cover,

said screw member moving said cone downwardly of said cover to engage said pair of plate members therebetween and separate the same causing said rollers to swing outwardly into pressure engagement with said tube and

means driving said circular plate member to move said rollers into pressure engagement with said tube extending through said arcuate path.

4,548,554

CEILING FAN CONTROL BOX

Paul G. Angott, 457 Hurst, Troy, Mich. 48098

Filed Apr. 26, 1984, Ser. No. 604,152
Int. Cl.⁴ F04B *21/00*
U.S. Cl. 417—572 **18 Claims**

1. A control box (10) for a ceiling fan comprising: a housing (12) having front and rear faces (14,16); a chamber (18) within said housing (12) for containing a remote control circuit (20) and an antennae (22); slot means (24) extending into and through said housing (12) for disposing said housing (12) around a support rod (26) of the ceiling fan; and mounting means for mounting said housing (12) on a ceiling fan support structure (34).

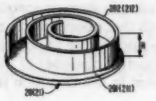
4,548,555

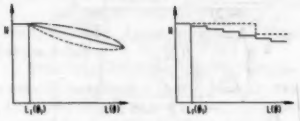
SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH NONUNIFORM SCROLL HEIGHT

Masaharu Hiraga, Honjo, and Yuji Yoshii, Takasaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Oct. 11, 1983, Ser. No. 450,860
Claims priority, application Japan, Sep. 10, 1982, 57-176989
Int. Cl.⁴ F01C *1/04, 21/08*
U.S. Cl. 418—55 **3 Claims**

1. In a scroll type fluid displacement apparatus including a housing, a pair of scrolls within said housing, one of said scrolls fixedly disposed relative to said housing and having an end plate from which a first wrap extends, the other scroll movably disposed for non-rotative orbital movement within the interior of said housing having an end plate from which a second wrap extends, said first and second wraps interfitting at an angular and a radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, and a driving and rotation-preventing mechanism operatively connected with said other scroll to effect orbital motion of the other scroll while preventing rotation thereof, thus causing the fluid pockets to change in volume, the two innermost fluid pockets eventually merging into a single pocket near the center portions of said wraps, the improvement wherein the center portion of at least one of said wraps is higher than the remaining portion





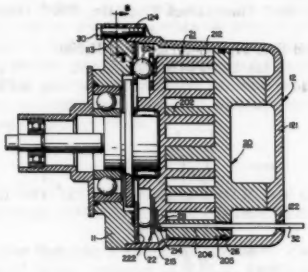
thereof, said center portion extending substantially from the inner end of said wrap outwardly at least to the location of the line contact between the curved surfaces of said wraps when said two innermost fluid pockets are merged into a single fluid pocket.

4,548,556

INTERFITTING MECHANISM OF SPIRAL ELEMENTS FOR SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Japan

Filed Jun. 4, 1984, Ser. No. 617,184
Claims priority, application Japan, Jun. 3, 1983, 58-99926
Int. Cl.⁴ F01C *1/04;* B23P *15/00*
U.S. Cl. 418—55 **5 Claims**



1. In a scroll-type fluid displacement apparatus including a housing having a front end plate and a casing having an end plate portion, assembly means for assembling said front end plate to said casing, a first scroll member having a first end plate from which a first spiral element extends, a second scroll member having a second end plate from which a second spiral element extends, said first and second scroll members interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected to said second scroll member to effect the orbital motion of said second scroll member, a rotation-preventing/thrust-bearing mechanism for preventing the rotation of said second scroll member, whereby the fluid pockets, change volume, the improvement comprising said first scroll member having a first hole therethrough,

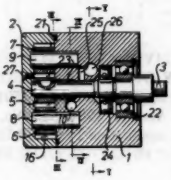
said first hole positioned on a line perpendicular to a line through a plurality of said line contacts, said second end plate of said second scroll member having a bore, said end plate portion of said casing having a second hole therethrough, so that said second hole, said bore, and said first hole may be placed in substantial alignment by an adjusting member inserted into said bore, said first hole and said second hole during assembly of the apparatus, whereby said assembly means allows said front end plate to be rotated in the driving direction of said driving mechanism to set the angular relationship between said scroll members.

4,548,557

HYDRAULIC PUMP OR MOTOR WITH INTERCHANGEABLE GEARS

Jerzy Janczak, S:t Mickelsgatan 71, S-126 54 Hägersten, Sweden

Filed Jun. 16, 1983, Ser. No. 504,992
Claims priority, application Sweden, Jun. 23, 1982, 8203923
Int. Cl.[4] F04C *2/00*
U.S. Cl. 418—76 **5 Claims**



1. A fluid pump or motor, comprising:

(a) a housing including a mounting member (**1**) and a readily exchangeable cover member (**2**) sealingly joined to an end face of the mounting member,

(b) a first shaft (**4**) rotatably journalled in the mounting member and extending outwardly from said end face,

(c) two second shafts (**8, 9**) fixedly mounted in the mounting member and extending outwardly from said end face spaced from and parallel to the first shaft,

(d) respective fluid inlet and fluid outlet channels (**10, 11**) defined in the mounting member and having openings (**12–15**) in said end face,

(e) a sun gear (**5**) removably mounted on the outward extension of the first shaft and fixed thereto for rotation therewith,

(f) two planet gears (**6, 7**) rotatably and removably journalled on the respective outward extensions of the second shafts and in mesh with the sun gear,

(g) blind wells (**16**) defined in the cover member configured to closely accommodate the sun and planet gears and serving as a pressure chamber, and

(h) blind bores (**17–20**) defined in the cover member, communicating with said blind wells, and positioned to correspond with said fluid inlet and outlet channel openings in said end face upon assembly of the housing, whereby one cover member and associated gears may be replaced by another, different cover member and different associated gears to thereby change the pump or motor capacity or fluid transmission ratio without dismantling, dismounting or otherwise disturbing the mounting member and fluid lines connected thereto,

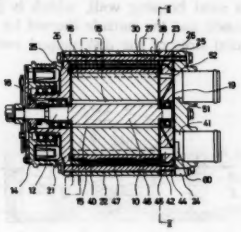
(i) wherein the mounting member is provided with an inlet and an outlet for hydraulic oil which each communicate with a respective channel, each of said channels is branched and forms two openings in said end face, and the cover member includes four blind bores which communicate with the wells therein.

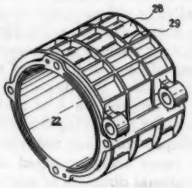
4,548,558

ROTARY COMPRESSOR HOUSING

Hiroshi Sakamaki, Utsunomiya; Susumu Sugishita, Hanyu, and Yukio Horikoshi, Kazo, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 559,811
Claims priority, application Japan, Dec. 13, 1982, 57-217112
Int. Cl.[4] F04C *18/00, 29/04;* B32B *3/12*
U.S. Cl. 418—83 **8 Claims**





1. A rotary compressor housing for use in a sliding-vane type compressor comprising a center housing having the outer periphery thereof integrally formed with reinforcing grids containing circumferentially and axially extending ribs, and front and rear side housings fastened to said center housing with the intervention of a plurality of bolts, said center housing being formed with a plurality of thickened portions which extend the entire axial length thereof and through which said bolts pass, said thickened portions being peripherally connected with each other by said reinforcing grids, whereby the inner periphery of the center housing can expand thermally without losing its circular shape.

4,548,559

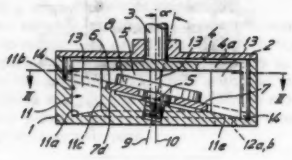
ROTARY UNIT

Wolfhart Willimczik, Schloss-Strasse 60, D-8037 Olching/Esting, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 521,221, Sep. 10, 1983, abandoned, which is a continuation of Ser. No. 201,523, Oct. 28, 1980, abandoned. This application Sep. 12, 1984, Ser. No. 650,302
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946304
Int. Cl.[4] F01C *3/04, 19/10*
U.S. Cl. 418—136 **12 Claims**

1. In a rotary piston machine for use in pumps, compressors, and processing machines with varying capacity for flowing media, which rotary piston machine comprises a housing having walls forming a working space therein, a drive shaft outwardly penetrating the housing, an impeller mounted in the housing and connected to said drive shaft, said impeller having axial vanes that penetrate the working space of the housing, a disk-shaped rotor is rotatably arranged in the housing, and provided with radial slots for receiving therein the axial vanes of said impeller, and a contacting surface is disposed on the bottom of the housing for supporting the disk-shaped rotor

therein, the axial vanes penetrating the disk-shaped rotor through the radial slots thereof and projecting there-through into the working space, the vanes being rotatable about an axis forming an acute angle with the rotational axis of the disk-shaped rotor, and vanes being disposed in the working space in a slidingly sealing manner along the walls of the working space so that the outer diameter of the disk-shaped rotor is greater than the outer diameter of a said impeller, the improvement which comprises the working space formed as an annular groove in an axial housing wall, which is radially covered toward the inside and the outside thereof by the disk-shaped rotor, the radial slots of the disk-shaped rotor being longer



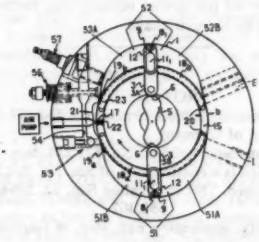
than the axial vanes in radial dilation or extent towards the inside and outside thereof, and having a V-shaped cross-section such that their bevelled or oblique walls are inclined relative to their center surface at least as much as the axes of the vanes and the disk-shaped rotor are inclined to one another, respectively, the narrowest points of each of the radial slots lying in said contacting surface between the disk-shaped rotor and the housing, the point of intersection S of both the axes of the vanes and the disk-shaped rotor lying in said contacting surface between the disk-shaped rotor and the housing, and at lease some of the axial vanes being arranged slightly elastically rotatably in the peripheral direction of said impeller.

4,548,560

SEAL SYSTEM IN ROTARY ENGINE

Mitsuhiro Kanao, Yakeyama-cho 2156-14, Kure-shi, Hiroshima-ken, 737, Japan

Filed Jul. 19, 1983, Ser. No. 515,319
Claims priority, application Japan, Jul. 23, 1982, 57-129377
Int. Cl.[4] F01C *19/04, 19/08;* **F02B** *53/04*
U.S. Cl. 418—144 **4 Claims**



1. A seal system in a rotary engine, comprising a rotor housing having an inner wall surface and a side wall, a rotor rotatably disposed in said rotor housing, a sliding plate supported on said rotor, an apex seal supported on said sliding plate and slidably held against said inner wall surface, said apex seal having a first substantially frustoconical recess defined in an end thereof and including a first slant surface, a first substantially frustoconical split ring fitted complementarily in said first recess and capable of being pressed against said side wall of said rotor housing under a gas pressure acting on said first split ring through said first slant surface, said sliding plate having a second substantially frustoconical recess defined in an end thereof and including a second slant surface, and a second substantially frustoconical split ring fitted complementarily in said second recess and capable of being pressed against said side wall of said rotor housing under a gas pressure acting on said second split ring through said second slant surface.

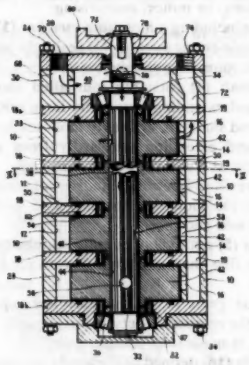
3. A seal system in a rotary engine, comprising a rotor housing including a side housing member having a circular groove, a rotor rotatably disposed in said rotor housing, a split ring disposed in said circular groove and having a gap, and a split pipe extending radially through said split ring at said gap for expanding said split ring radially outwardly to provide a seal against said side housing member and a seal against said gap, said split ring having a compressed gas pressure slot and a combusted gas pressure slot, said side housing member having a compressed gas entry port and a combusted gas entry port for introducing a gas pressure into said compressed gas pressure slot and said combusted gas pressure slot, respectively, to lift said split ring in a direction out of said circular groove and press said split ring against said rotor.

4,548,561

ROTARY HYDRAULIC MACHINE WITH A MULTIPLICITY OF AXIALLY ALIGNED CHAMBERS

Joseph Bitar, 16, rue Felicien David, 75016 Paris, France

Filed Apr. 24, 1984, Ser. No. 603,649
Claims priority, application France, Mar. 16, 1984, 84 04050
Int. Cl.[4] F01C *1/00, 11/00;* **F03C** *2/00*
U.S. Cl. 418—184 **8 Claims**



1. In a hydraulic machine of the type comprising a multiplicity of aligned chambers, each housing a cylindrical rotor in eccentric relation to the chamber and each being provided with a radially extensive cavity receiving radially movable distribution and separation elements, the chambers including walls having openings for the discharge of hydraulic fluid, the improvement in which;

said rotors each comprise

a grooves axial bore, and

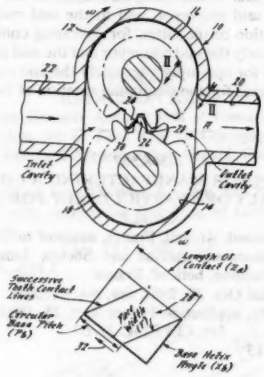
a radial passage between said bore and each radial cavity; and

a grooved and hollow central shaft having a multiplicity of passages in alignment with the passages respectively associated with each cavity, said shaft constituting valveless means for simultaneously introducing fluid into chambers and angularly fixing the various rotors relative to one another.

4,548,562
HELICAL GEAR PUMP WITH SPECIFIC HELIX ANGLE, TOOTH CONTACT LENGTH AND CIRCULAR BASE PITCH RELATIONSHIP

Douglas Hughson, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01215, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982, PCT Pub. No. WO84/01004, PCT Pub. Date Mar. 15, 1984
PCT Filed Sep. 7, 1982, Ser. No. 432,889
Int. Cl.[4] F04C 2/16
U.S. Cl. 418—189 2 Claims



1. A positive displacement external hydraulic gear pump comprising a pump housing having two pumping chambers;

a first pumping gear journalled rotatably in one pumping chamber and a second pumping gear meshing with the first pumping gear in a second of said pumping chambers;

an inlet port and inlet cavity in said housing on one side of said gears in the region of the meshing teeth for the respective gears and an outlet port and outlet cavity on the opposite side of said meshing teeth;

said gears having teeth that are helical, the form contact ratio for the meshing helical teeth being greater than unity and engaging along tooth contact lines;

the tooth space volumes between pump teeth for said gears being adapted to communicate sequentially with said outlet cavity and said inlet cavity;

such communication between the inlet cavity and each tooth space volume bounded at successive instants by two successive tooth contact lines being established as such communication between the outlet cavity and that tooth space volume is interrupted whereby that tooth space volume communicates only with said outlet cavity immediately before each such instant and only with said inlet cavity immediately after that instant;

the relationship between the base helix angle of said teeth and the length of tooth contact for said gears having a specified circular base pitch and face width is expressed as follows:

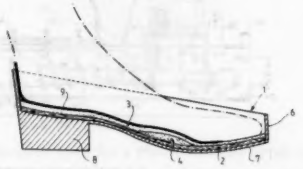
$$\text{tangent } X_b = \frac{(Z_a - P_b)}{F}$$

where X_b=base helix angle, Z_a=length of tooth contact, F=face width and P_b=circular base pitch.

4,548,563
MOLD FOR FORMING ORTHOPEDIC SOLES AND PLANTAR MOLDINGS ADAPTED TO THE FEET OF PATIENTS

Charles V. Y. Aigrefeuille, Versailles, France, assignor to Societe Francaise d'Orthopodie, Paris, France

Filed Sep. 4, 1984, Ser. No. 647,099
Claims priority, application France, Sep. 5, 1983, 83 14163
Int. Cl.[4] B29C 1/00
U.S. Cl. 425—2 3 Claims

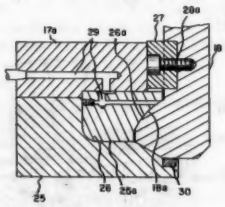


1. A mold for forming orthopedic soles and plantar moldings adapted to the feet of patients, formed by a tray (1) whose bottom (7) reproduces the shape and the instep of a shoe, characterized by the presence of means (2) for fixing, to this bottom defined by an essentially vertical wall, relief correcting elements (4, 5) for conferring thereon a surface adapted to the plantar arch of the patient, said means being formed by an inner sole (2) bonded to the bottom of the tray and covered with a layer of material ensuring self fastening in cooperation with a similar layer fixed under each of the correcting elements (4, 5), and a flexible and resilient cushion (3) extending over this bottom.

4,548,564
SELF-ALIGNMENT APPARATUS FOR MOLDS OF A TIRE VULCANIZING PRESS

Bryan E. Nixon; Larry E. Steidl, both of Akron, Ohio; Itaru Amano, Kobe, Japan; Yasuhiko Fujieda, Hyogo, Japan; Hisaaki Onishi, and Hideo Miyauchi, both of Kobe, Japan, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1984, Ser. No. 644,298
Claims priority, application Japan, Sep. 13, 1983, 58-169937
Int. Cl.[4] B29H 5/02
U.S. Cl. 425—32 5 Claims



1. In a tire vulcanizing press having upper and lower mold halves moveably supported on upper and lower platens for movement toward and away from each other and located between a vertically moveable top link and a fixed base, means for decoupling of the platens from torque applied by the press structure applying the closing force to the mold halves providing for arcuate movement of the platens for self-aligning of the mold halves into concentric arrangement upon closing of the press, the means for allowing decoupling and self-aligning being located between the platens and the press.

4,548,565

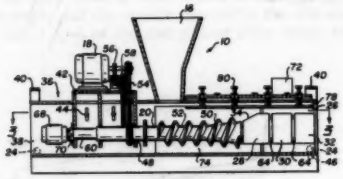
EXTRUSION MACHINE

Christopher B. Bunn, North Vancouver, Canada, assignor to DY-Core Systems Ireland Limited, Dublin, Ireland

Continuation of Ser. No. 323,648, Nov. 20, 1981, abandoned. This application May 25, 1984, Ser. No. 614,395

Int. Cl.⁴ B28B *1/08, 3/22*

U.S. Cl. 425—64 **8 Claims**



1. An extrusion machine for making elongated articles of concrete by forcing the concrete through a mold, the article having a relatively large core, the machine being moved forwardly by reaction as the concrete is forced against the molded concrete, a rotatable spiral conveyor in and extending longitudinally of the mold for moving the concrete through the mold;

a non-rotatable forming element in the mold to form the internal cavity immediately following the downstream end of the conveyor, the forming element having

(a) a lower edge positioned so that not more than 10% of the height of the forming element is below the lower edge of the conveyor, the lower edge and lower sides of the element being free of any substantial ramp;

(b) a longitudinal center line higher than the center line of the conveyor; and

(c) a ramp extending upwardly from the downstream end of the conveyor;

the conveyor forcing the concrete over the forming elements to form the concrete article.

4,548,566

AUTOMATIC MACHINE FOR FORMING AND DISTRIBUTING BAKERY PRODUCTS OF VARIOUS SHAPES IN BAKING TINS

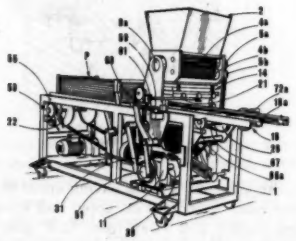
Folli Renzo, Via I. Bedeschi, 5-48017 Conselice (Ravenna), and Casadei Marino, Via Provinciale S. Mauro, 3501-47023 Cesena (Forli), both of Italy

Filed May 22, 1984, Ser. No. 613,083

Claims priority, application Italy, Jun. 3, 1983, 3447 A/83

Int. Cl.⁴ A21C *3/04, 11/10*

U.S. Cl. 425—110 **14 Claims**



1. Automatic machine for forming and distributing bakery products of various shapes in baking tins, of the type that comprises: extrusion means, a sweetened paste kneading device, operated by a first geared motor, provided to supply the said paste to said extrusion means connected thereto; a conveyor, driven by a second geared motor, for supplying baking tins in succession to the overhead said extrusion means; means for the oscillating rotation of the said conveyor, at an adjustable angle, operated by a third geared motor; and a cutter device, operated by the said third geared motor, placed at the side of the said extrusion group and operating underneath this in order to cut the extruded ropes of sweetened paste into a number of products of predetermined length; the said extrusion means being constituted by two vertical tubular blocks, coupled telescopically one to the other, with the first tubular block placed beneath and integral with the frame of the said kneading device, and with the second tubular block sliding axially with respect to the first, control means for said second tubular block, the said second tubular block being closed at the bottom by an extrusion plate provided with a plurality of molds and defining, with the said two tubular blocks, a variable volume chamber; electrical means being connected to the said cutter device, to the said conveyor, and to the said means for the oscillating rotation of the latter, for operating contemporaneously or alternately the said conveyor and the said paste kneading device, and for operating alternately the said cutter device and the said means for the oscillating rotation of the said conveyor.

4,548,567

APPARATUS FOR MANUFACTURING A GROOVED CYLINDRICAL CORE PARTICULARLY FOR OPTICAL CABLE

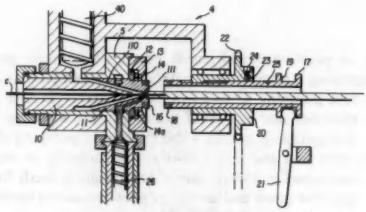
Bernard M. Missout, Arcueil, France, assignor to Societe Anonyme de Telecommunications and Societe Industrielle de Liaisons Electriques, both of, France

Filed Oct. 28, 1982, Ser. No. 437,310

Claims priority, application France, Oct. 28, 1981, 81 20203

Int. Cl.⁴ B29C *21/00*

U.S. Cl. 425—113 **26 Claims**



1. A device for manufacturing a cylindrical core having helical peripheral grooves, comprising:

a main extruder;

a rotating die means having a first extrusion bore for guiding a flow of extrusion material from said main extruder to form the cylindrical core and a second extrusion bore formed with die channels, each channel having a cross section corresponding respectively to the cross section of ribs defining said peripheral grooves therebetween;

said first and second extrusion bores of the rotating die means formed within a single rotating integral die; and

auxiliary extruder means connected to the main extruder for feeding an extrusion material of a different color from that of said main extruder along a feed path having conduits within the integral body of said die in communication with at least one of said die channels.

26. A method of manufacturing an optical cable having a cylindrical core formed with helical peripheral grooves adopted to carry optical fibers therein, comprising the steps of:

(a) directing a flow of extrusion material into a tapered interior cavity formed between a tapered tube and an extruder head;

(b) guiding said flow of extrusion material from said cavity into a first extrusion bore formed within a single rotating die while feeding a strength member through a central

hollow region of said tapered tube so that said extrusion material covers said central member to form said cable therewith whereby said cable is reinforced by the central member;

(c) feeding said formed cylindrical core from the first extrusion bore into a second extrusion bore formed with die channels within said single die to impart to said cylindrical core a series of circumferentially spaced ribs having a cross section corresponding respectively to the cross section of said die channels; and

(d) cooling said grooved cylindrical core after it passes through said single rotating die.

4,548,568

EXTRUSION HEAD

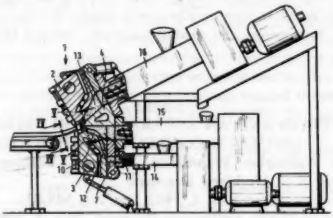
Adolf Herbert; Dietmar Anders, both of Hanover, and Günter Meier, Ahlem, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,709

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238284

Int. Cl.⁴ B29F *3/04*

U.S. Cl. 425—131.1 **1 Claim**



1. An extrusion head for producing flat profiles from a plurality of rubber or plastics material mixtures comprising:

(a) a plurality of worm or screw extrusion devices, each said extrusion device supplying and feeding one of said mixtures;

(b) an extrusion head located downstream of said plurality of extrusion devices and receiving said mixtures supplied and fed by said device, said head having upper, central and lower portions, said central portion being fixedly mounted and said upper and said lower portions of said head each being pivotally movable relative to said central portion, each of said central, upper and lower portions having at least one plane surface;

(c) a first interchangeable insert member located between said upper portion and said central portion of said head;

(d) a second interchangeable insert member located between said central portion and said lower portion of said head;

(e) said insert members each having upper and lower surfaces, at least one of said upper and lower surfaces of each said insert member defining flow channels for said material supplied and fed to said head by said extrusion devices, each said flow channel being bounded, in an upward or downward direction, by one of said plane surfaces of said upper, central or lower portions of said head; and

(f) wherein said flow channels each have a longitudinal axis of symmetry, all of which are disposed in a common vertical plane whereby the flow rates of said mixtures can be maintained constant in all of said flow channels.

4,548,569

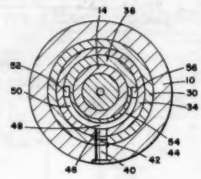
ACCUMULATOR HEAD

Frank J. Pitigliano, Bedminster, and Paul E. McGill, Neshanic, both of N.J., assignors to Somerset Technologies, Inc., New Brunswick, N.J.

Filed Aug. 6, 1984, Ser. No. 637,962

Int. Cl.⁴ B29D *23/04*

U.S. Cl. 425—133.1 **17 Claims**



1. An accumulator head for a plastic-forming apparatus, the accumulator head comprising:

an outer body defining at least one cavity extending longitudinally therein, the outer body defining at least a first plasticized material entrance therethrough which is adapted to be interconnected with a first source of plasticized material;

an inner mandrel disposed longitudinally in the outer body cavity;

a ram assembly disposed in the outer body cavity intermediate the outer body and the mandrel for longitudinally reciprocating movement and with the ram assembly defining at least a first plastic conveying passage array therein, wherein the ram assembly includes an outer ram member, an intermediate ram member, and an inner ram member, the first passage array being defined between the outer and intermediate ram members the first passage array having a first array inlet which is operatively connected with the first plasticized material entrance to receive plasticized material therefrom and a first array outlet for discharging plasticized material into the outer body cavity between the outer body and the mandrel, a second plastic conveying passage array having a second array outlet for discharging plasticized material into the outer body cavity, the second passage array being defined between the intermediate and inner ram members.

4,548,570

EXTRUSION APPARATUS FOR PRODUCING THERMOPLASTIC PIPE

Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed May 12, 1983, Ser. No. 493,839

Int. Cl.⁴ B29F *3/08*

U.S. Cl. 425—141 **4 Claims**

1. A die apparatus for producing thermoplastic pipe, the apparatus comprising

(a) a housing including a bore therethrough, the bore having an inlet and a discharge end;

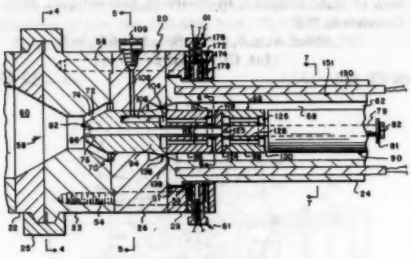
(b) a mandrel supported within the bore and defining therein an annular extrusion passageway for transporting an annular stream of a thermoplastic material therethrough;

(c) a sleeve radially movable within the housing, the sleeve circumscribing the mandrel to define a continuation of the extrusion passageway for transporting an annular stream of thermoplastic material therethrough; and

(d) means in said sleeve for selectively heating a section of the sleeve to increase the temperature of the thermoplastic material, reducing the viscosity thereof and thereby changing the thickness of the annular stream of thermoplastic material transported in proximity thereto; and

(e) radial expansion means, located in and positioned circumferentially about the housing, in engagement with said sleeve

to radially reposition the sleeve within the housing when heated; and



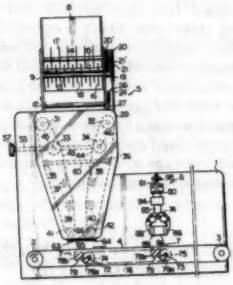
(f) control means for causing heating of a selected section of said sleeve and for simultaneously causing heating of a diametrically opposed radial expansion means.

4,548,571

FOOD SHAPING APPARATUS

Kisaku Suzuki, 1-19-8, Toshida, Nerima-ku, Tokyo, Japan

Division of Ser. No. 408,974, Aug. 17, 1982, Pat. No. 4,460,611.
This application Jul. 3, 1984, Ser. No. 627,386
Claims priority, application Japan, Aug. 20, 1981, 56-123394; Oct. 30, 1981, 56-163285; Nov. 26, 1981, 56-190261; Dec. 25, 1981, 56-197719
Int. Cl.[4] A23P *1/00*; A22C *7/00*
U.S. Cl. 425—297 **16 Claims**



1. A food shaping apparatus for shaping a foodstuff comprising, in combination:

feeding means for feeding the foodstuff downward, the feeding means comprising a pair of substantially vertically extending feed belts which are moved in opposite directions to each other, said foodstuff being moved downward into a path defined between said feed belts while being progressively compressed between the feed belts, said path between the feed belts being progressively reduced in width;

cutter means for cutting a predetermined amount or length of the foodstuff, the cutter means comprising shutters which are moved toward and away from each other in the lateral direction;

a flexible cup member formed of resilient material and provided with a cavity which is open at one end thereof for receiving the cut length of the foodstuff therein; and

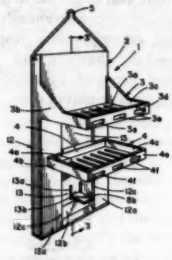
presser means located outside the flexible cup member for pressing the cut length of the foodstuff through the flexible cup member to shape the foodstuff.

4,548,572

SOAP SAVING RACK

Edward C. Hoffman, 4 Kane Ct., Clarendon Hills, Ill. 60514

Filed May 24, 1984, Ser. No. 613,624
Int. Cl.[4] B29C *3/00, 27/00*
U.S. Cl. 425—410 **12 Claims**



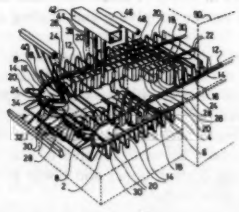
1. A soap saving device for pressure bonding two or more pieces of soap, comprising a frame supportable on a wall, a first soap tray fixed to and supported by the frame, means including a second soap tray moveable relative to both the first soap tray and the frame and also supported by the frame, means when disengaged moving the second soap tray toward the first soap tray to cause the two soap trays to clamp forcibly therebetween two or more pieces of soap stacked on the second tray to exert a pressure bonding force causing the two pieces of soap to bond to one another, and means for disengaging the means for moving the second soap tray toward the first soap tray.

4,548,573

METHOD AND AN APPARATUS FOR PRODUCING MOULDED CONFECTION ARTICLES

Ejvind Waldström, Hundslund, Denmark, assignor to O. G. Hoyer A/S, Hojbjerg, Denmark

Filed Nov. 4, 1983, Ser. No. 548,821
Claims priority, application Denmark, Nov. 5, 1982, 4909/82
Int. Cl.[4] B29D *31/00*; A23G *9/26*
U.S. Cl. 425—442 **11 Claims**



1. An apparatus for manufacturing moulded or frozen products, the apparatus comprising plural rows of individual moulds and means for moving the rows of invidual moulds successively through a filling station, a setting or freezing zone and a discharge station, said rows being disposed transversely of the direction of said moving, each of the moulds comprising opposed, separable mould parts, which, in said discharge station, are caused to be separated for removal of the product, characterized in that the moulds are openable generally in the direction of moving, and that guiding means are provided for holding the consecutive moulds as moved along said setting or freezing zone mutually spaced insufficiently for operational opening of the moulds, while, in or before said discharge station, means are provided for increasing the mutual distance

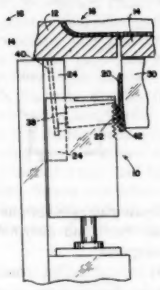
between the rows sufficiently to permit operational opening of the moulds for discharge of the moulded products therefrom, said means for opening the moulds being separate from said means for increasing the mutual distance between the rows.

4,548,574

BLOW MOLDING DETABBER

Vito Badalamenti, Santa Rosa, and Nicholas J. Weller, Petaluma, both of Calif., assignors to Kal Tool Engineering, Petaluma, Calif.

Filed Oct. 25, 1984, Ser. No. 664,542
Int. Cl.[4] B29C *17/12, 17/07, 23/00*
U.S. Cl. 425—531 **5 Claims**



1. Detabbing apparatus for use with a blow molding machine wherein a hollow plastic article is formed with a tab attached thereto and depending therefrom, said apparatus comprising:

a tab puller to be mounted below said blow molding machine for movement from a position adjacent the location of said blow molding machine to a position spaced therefrom;

means on the outer surface of said tab puller for gripping a tab.

piston means secured to said tab puller for movement thereof;

a pusher finger carried on said tab puller for transverse movement thereon from a retracted position to an extended position protruding beyond said outer surface of the tab puller; and

means responsive to downward movement of said tab puller for moving said pusher finger to its extended position.

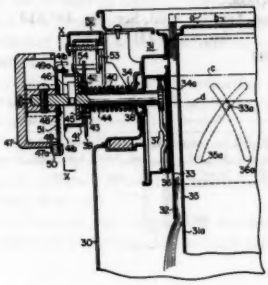
4,548,575

OIL HEATING EQUIPMENT

Yukio Hirauchi, Nara, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jun. 13, 1984, Ser. No. 620,264
Claims priority, application Japan, Jun. 17, 1983, 58-109569
Int. Cl.[4] F23D *3/28;* **F23Q** *25/00*
U.S. Cl. 431—88 **3 Claims**

1. An oil heating equipment comprising: a wick driving shaft; spring means which is adapted to be loaded to such an extent as to be able to lower a wick from a raised position to an extinction position; a ratchet wheel mounted on the wick driving shaft and provided on the periphery thereof with a plurality of teeth; an operative connecting means for operatively connecting said ratchet wheel to said wick driving shaft; a locking means resiliently biased into engagement with a tooth on said ratchet wheel to lock said ratchet wheel from rotating in the same direction as the rotation of said wick driving shaft for lowering the wick; and an anti-earthquake emergency extinction means for disengaging said locking means to release said ratchet wheel; wherein said operative connecting means includes a connecting mechanism which permits said ratchet wheel to rotate following the rotation of said wick driving shaft in the wick raising direction but to prevent said ratchet wheel from rotating when said wick driving shaft is rotated in the wick lowering direction, a limiting mechanism for limiting the manual rotation of said wick driving shaft in the wick lowering direction to a predetermined range, a limit dismissing mechanism for dismissing the limitation imposed by said limiting mechanism, thereby allowing said wick driving shaft to rotate in the wick lowering direction beyond said range, and a stop mechanism which is adapted to stop, when said wick



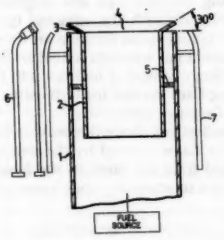
driving shaft is manually rotated after the dismissal of the limit of rotation range, said wick driving shaft at a rotational position aback from the rotational position to which said wick driving shaft is rotated when said wick is lowered quickly by the force of said spring means after said locking means is made inoperative by the operation of said anti-earthquake emergency extinction means.

4,548,576

FLAME STABILIZER

David A. Chesters, Walton-on-Thames, England, assignor to British Petroleum Company, London, England

Continuation of Ser. No. 60,607, Jul. 25, 1979, abandoned. This application Mar. 27, 1984, Ser. No. 593,919
Claims priority, application United Kingdom, Aug. 8, 1978, 32578/78
Int. Cl.[4] F23D *13/20*
U.S. Cl. 431—202 **9 Claims**



1. An apparatus for the burning of combustible neat gas from industrial chemical and refining operations comprising a flare for disposing of combustible neat gas in industrial, refining, chemical, and oil production operations, said flare having a substantially vertically disposed pipe connected to a source of combustible neat gas, said pipe having a flame stabilizer comprising a cylinder co-axial with and lying substantially within the pipe, the length of the cylinder within the pipe being at least ten times the mean radial distance between the inner circumference of the pipe and the outer circumference of the cylinder, the cylinder being surmounted with a cone at the outlet of the pipe, the cone diverging in the direction of gas flow through the pipe at an angle of from 20° to 40° to the horizontal, the length of the cone being from one to twenty

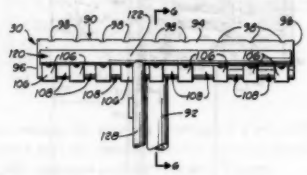
times the mean radial distance between the inner circumference of the pipe and the outer circumference of the cylinder.

4,548,577

LINEAR COMBUSTION APPARATUS FOR ATMOSPHERIC BURNING OF FLARE GASES

Eugene C. McGill, Skiatook, Okla., assignor to McGill Incorporated, Tulsa, Okla.

Filed Apr. 18, 1983, Ser. No. 485,618
Int. Cl.⁴ F23D *13/20*
U.S. Cl. 431—202 **7 Claims**



1. A linear combustion apparatus for burning flare gas over a widely varying flow rate, the combustion apparatus comprising:

a flare gas header conduit connectable to a source of flare gas;

a plurality of flare gas conduits, each of the flare gas conduits having a first end, each of the flare gas conduits connected to the flare gas header conduit at its respective first end;

a plurality of burner assemblies, each burner assembly having at least one T-shaped burner, an inlet portion and a substantially horizontally disposed tubular body portion, the inlet portion of each of the burners connected to one of the flare gas conduits, the body portion having a plurality of burner ports aligned along an upper surface thereof, each burner characterized as having a plurality of ignition ports along each side of the tubular body portion and having a plurality of spaced apart tab members supported by the body portion, one each of the tab members disposed substantially below a corresponding one of the ignition ports and each tab member having an air passage port extending therethrough and disposed substantially below and aligned with the adjacent ignition port, the spaced apart tab members forming air directing channels between adjacent tab members so that air flowing through the air directing channels is induced into the combustion of discharging flare gas and for turbulating the mixture of said air and flare gas; and

housing means disposed about the burners for substantially containing the flame created by the combustion of flare gas discharged from the burners, the housing characterized as having a substantially open lower end and an open upper end.

4,548,578

BURNER FOR GENERATION OF A FLOW OF HOT GAS, ESPECIALLY FOR SHRINKING PLASTIC FOILS

Reiner W. Hannen, Goch, Fed. Rep. of Germany, assignor to MSK-Verpackungs-Systeme Gesellschaft mit beschrankter Haftung, Kleve, Fed. Rep. of Germany

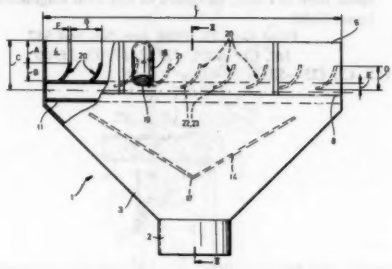
Filed Apr. 6, 1984, Ser. No. 597,446
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 8310308[U]
Int. Cl.⁴ F23D *13/24*
U.S. Cl. 431—350 **17 Claims**

1. A burner for generating a flat hot gas stream for the thermal shrinkage of a synthetic resin foil comprising:

a fan-shaped pressure distribution chamber defined between a pair of fan-shaped walls and having a narrow end and a wide end, said walls extending beyond said wide end to define a burner chamber extending over the entire length of said wide end and having an elongated cross section opening at a mouth of said burner chamber;

inlet means for introducing a gas to said pressure distribution chamber;

a flame-retaining tube disposed between said walls substantially at the junction between said chambers and defining



with said walls narrow passages for gas flow between said tube and said walls from said distribution chamber into said burner chamber; and

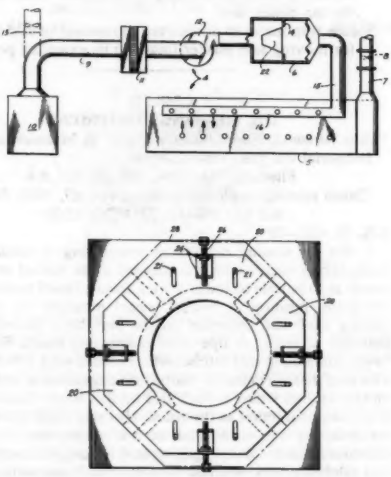
a row of spaced apart curved baffles straddling said tube and mounted on said tube downstream of said pressure distribution chamber while having free ends reaching toward said mouth, said baffles bridging said walls and being connected thereto.

4,548,579

COMPOUND REDUCING OVEN

Roger D. Cunningham, Jackson, Mich., assignor to Blu-Surf, Inc., Parma, Mich.

Filed Aug. 1, 1983, Ser. No. 519,481
Int. Cl.⁴ F23J *15/00*
U.S. Cl. 432—72 **6 Claims**



1. Apparatus for treatment of exhaust gases containing volatile compounds, as from a spray booth, comprising:

a combustion chamber having a central burner therein and a fuel inlet to said burner; exhaust gas ducting to said com-

bustion chamber upstream of said burner, and discharge ducting downstream of said burner; gas propelling means in said exhaust gas ducting for supplying exhaust gases to said combustion chamber under pressure; a series of profile defining plates peripherally around said burner and radially spaced therefrom to define an annular flow passage past said burner for pressurized exhaust gases to be combusted, and said plates having variable positioning means for radially movable relative to said burner to regulate the size of said annular flow passage.

5. For use in combination with a spray booth and a drying oven, apparatus for treating exhaust gases from the spray booth, comprising:

a combustion chamber, a burner in said chamber, exhaust gas ducting to said combustion chamber to conduct spray booth exhaust gases to said combustion chamber and said burner; gas propelling and pressurizing means in said exhaust gas ducting for supplying exhaust gases to said combustion chamber under pressure for combustion and heat generation; discharge ducting from said combustion chamber downstream of said burner, to conduct hot combustion gases to the drying oven, profiling means around said burner causing gases from said exhaust gas ducting to flow through an annulus past said burner for combustion and said profiling means comprises a series of elements having means for moving radially relative to said burner for control of the size of said annulus.

4,548,580

CALCINING APPARATUS FOR POWDERY MATERIALS

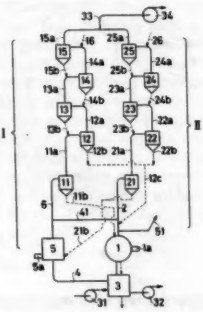
Hirofumi Hatano; Masayasu Yamazaki, both of Kitakyushu; Atsushi Sasaki, Hiroshima; Keigo Mikami, Hiroshima; Kiyomichi Taoda, Hiroshima, and Mitsuharu Murakami, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo K.K. and Mitsubishi Mining and Cement Co., Ltd., both of Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,439

Claims priority, application Japan, Dec. 4, 1981, 56-196104; Dec. 4, 1981, 56-196105; Dec. 4, 1981, 56-196106; Dec. 4, 1981, 56-196107

Int. Cl.⁴ F27B *7/02, 15/00;* **C04B** *7/02*

U.S. Cl. 432—106 **7 Claims**



1. A calcining apparatus for powdery material, which comprises

A. a first preheating series consisting of a calcining kiln and a calcining kiln exhaust pipe connecting said calcining kiln to a first plurality of preheaters for preheating powdery material with exhaust gas from said calcining kiln said first plurality of preheaters including a lowermost first series preheater in direct operative relationship with said calcining kiln and a second preheater in direct operative relationship with said lowermost preheater in said first preheating series,

B. a second preheating series consisting of a rotary kiln and a rotary kiln exhaust pipe connecting said rotary kiln to a second plurality of preheaters for preheating powdery material with exhaust gas from said rotary kiln, said second series of preheaters including a lowermost second series preheater in direct operative relationship with said rotary kiln and a second preheater in direct operative relationship with said first lowermost preheater in said second preheating series,

C. means for permitting separate portions of material to be calcined into each of said preheating preheater series at the preheater in each series most remote from the kilns of each series,

D. a converging conduit pipe for collecting and combining the portions of material from the second preheater of each of said preheater series,

E. means for circulating said combined portions through a powdery material circulating circuit comprising said calcining kiln and each of said lowermost preheaters and into said rotary kiln, and

F. a connecting gas pipe connecting said calcining kiln exhaust pipe and said rotary kiln exhaust pipe.

4,548,581

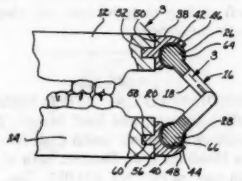
DENTAL MODEL ARTICULATOR

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Filed May 9, 1984, Ser. No. 608,396

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—64 **11 Claims**



1. An articulator for correlating the casts of a dental model, each of the casts including a mounting, said articulator comprising in combination:

(a) a pair of resiliently flexible brackets, each said bracket terminating at one end;

(b) means for pivoting the one end of one bracket with the one end of the other bracket about a common pivot axis; and

(c) means for interconnecting each of the casts with another end of one bracket of said pair of brackets, said interconnecting means including a ball and socket joint and a groove formed within a surface of said ball and socket joint and wherein one of the ball and socket of said ball and socket joint is defined by the mounting and wherein the other of the ball and socket of said ball and socket joint is formed by said bracket; whereby, the angular relationship between each cast and the interconnected one of said pair of brackets may be fixed after registration of the casts relative to one another by adjusting the angular relationship between each mounting and its engaged one of said pair of brackets and by adjusting the angular relationship about the pivot axis between the pivotally connected ends of said pair of brackets.

4,548,582

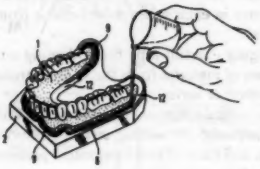
METHOD OF MAKING DENTAL PROSTHESES

Herbert Dörpinghaus, Elisabethstrasse 38, D-4970 Bad Oeynhausen 1, and Gerhard Eikermann, Auf der Hude 45, D-4970 Bad Oeynhausen 2, both of Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,523

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—213 **5 Claims**



1. In a method of making dental prostheses for the upper or lower jaw out of new prostheses produced by conventional means or out of old prostheses provided with a correction impression, comprising the steps of: preparing an occlusion model representing a jaw impression obtained with the existing prosthesis; marking a guideline a substantially short distance from the edge of the prosthesis; applying a thin layer of adhesive to said guideline on the occlusion model to fasten a wax wire along the guideline and both ends of the wire fused together; grinding the dental prosthesis to a volume at which the wax wire when placed on the occlusion model will be completely unencumbered with respect to the prosthesis; refilling the edge of the prosthesis with a mass of plastic until the wax wire is completely embedded in the plastic and the freshly applied mass of plastic is polymerized; working the prosthesis after removal from the occlusion model; baking or evaporating the wax wire out of the prosthesis; grinding out the ring groove left when the wax wire is removed; and inserting tissue-compatible soft sealing material into the ring groove in the dental prosthesis thereabout.

4,548,583

BONDING TO CALCIFIED TISSUES

Dennis C. Smith, Toronto, and Rolf Maijer, Duncan, both of Canada, assignors to Dennis Smith Consulting Ltd., Toronto and Romada Holdings Ltd., Duncan, both of, Canada

Continuation-in-part of Ser. No. 424,051, Sep. 27, 1982, which is a continuation of Ser. No. 235,166, Sep. 27, 1981, Pat. No. 4,382,792. This application Oct. 27, 1983, Ser. No. 545,881

Int. Cl.⁴ A61K *6/08*

U.S. Cl. 433—228.1 **6 Claims**

1. In a method of bonding materials to calcified tissues including human teeth, the improvement which comprises the sequential operation of initially forming a crystal growth of gypsum crystals having a length of about 10 to about 25 micrometers and a thickness of about 2 to about 5 micrometers adhered to and nucleated within a surface of said tissues, and subsequently interlocking said bonding with said crystal growth and said tissues.

4,548,584

COMPUTER CONTROLLED MOBILE DEVICE

Max F. Townsend, Barnsley, England, assignor to Economatics (Education) Limited, Sheffield, England

Filed Jan. 9, 1984, Ser. No. 569,035

Claims priority, application United Kingdom, May 10, 1983, 8312810

Int. Cl.⁴ G09B *19/00*

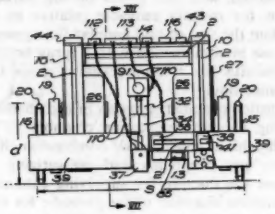
U.S. Cl. 434—118 **22 Claims**

1. A quantity-produced mobile device for connection to a computer separate therefrom, to be controlled thereby, comprising

a chassis structure provided with a plurality of attachment formations which are exposed so as to enable removable attachment of construction kit parts in a multiplicity of positions;

a pair of ground wheels mounted on said chassis structure, for propelling said device;

a pair of stepper motors also mounted on said chassis structure;



drive means connecting each said stepper motor to a respective ground wheel, for said stepper motor to drive said ground wheel; and

operating circuitry for energising said stepper motors to rotate by predetermined angular increments, under command of the computer.

4,548,585

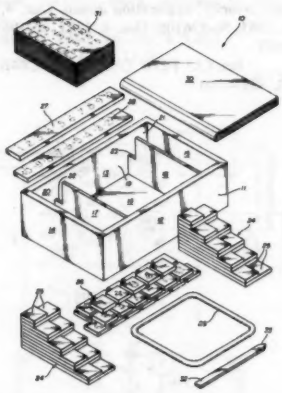
TEACHING AID FOR MATHEMATICS

Linda Kelly, 16951 Great Glen, Houston, Tex. 77084

Filed Jan. 26, 1984, Ser. No. 574,006

Int. Cl.⁴ G09B *19/02*

U.S. Cl. 434—195 **16 Claims**



1. A kit of materials for teaching mathematics comprising two identical sets of individual thin flat rectangular and square plate members of appreciable thickness each bearing a different color and having a top surface divided into separate squares forming ten distinct shapes ranging from a single square to ten composite multiple squares for illustrating the numbers from one to ten, in which said single square and each square of said multiple squares are of the same size, said composite multiple squares being arranged in rows of two in side by side relation whereby even numbered members are squares or rectangles divided into an even number of identical squares and odd numbered members comprise an even numbered member with a single square integral therewith and projecting from the end of one of the rows of side by side squares,

each of said plate members having a bottom surface divided identically to the top surface and bearing a color different therefrom,

said plate members being adapted to teach arithmetic relations by fitting end to end for addition and stacking for subtraction,

a series of individual square tiles, certain ones bearing positive numbers from one to ten on one surface and negative numbers from one to ten on the reverse surface and certain other ones having arithmetic symbols printed on one surface, and

a pair of thin elongated rectangular members divided into evenly spaced increments, one bearing even numbers from one to ten and the other bearing identical increments and bearing negative numbers from one to ten.

4,548,586

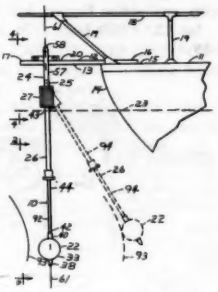
OUTBOARD MOTOR MOUNTING DEVICE AND COMBINATIONS THEREWITH

Joel P. Phillips, Jr., P.O. Box 1063, Winter Park, Fla. 32790

Filed Jul. 15, 1983, Ser. No. 513,806.

Int. Cl.⁴ B63H *5/12*

U.S. Cl. 440—6 **10 Claims**



1. In an outboard boat motor that has an electric motor assembly which is submersible in water, and a mounting device for suspending the motor assembly from a boat, the improved mounting device comprising upper and lower sections which are spaced apart along an axis that is fixed with respect to said upper section, said upper section being attachable to a boat, said lower section having opposite ends and being secured to said motor assembly at one of said opposite ends, and means mounted at the other of said opposite ends and providing a universal coupling along the axis between said upper and lower sections for pivotal movement of the lower section universally laterally of said axis, said coupling including yieldable means that resist such lateral pivotal movement of the lower section with respect to said axis.

4,548,587

OUTBOARD MOTOR SHIFT SHAFT CONNECTING PIN LOCK

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corp., Skokie, Ill.

Filed Dec. 23, 1983, Ser. No. 564,883

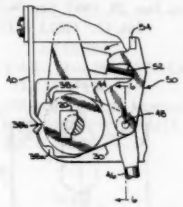
Int. Cl.⁴ B63H *21/28*

U.S. Cl. 440—86 **9 Claims**

1. In a marine drive having a rotatable shaft with a crank extending normal to the axis of rotation of said shaft, said crank being pivotally attached to a shift shaft by a connecting pin extending through said crank and shift shaft, said connecting pin lying on an axis of rotation parallel to and spaced from the axis of rotation of said rotatable shaft, an improved lock for retaining said connecting pin in said crank and shift shaft comprising:

a groove in said shaft adjacent said crank; and

a locking member fastened to said pin, said locking member comprising a plate extending normal to said pin and rotatable shaft, at least a portion of said plate having a thickness



less than the width of said groove in said rotatable shaft, said portion of said plate having a slot opening to the periphery of said plate by which said portion of said plate may be placed in said groove for retaining said connecting pin in said crank and shift shaft.

4,548,588

SWIMMING AID

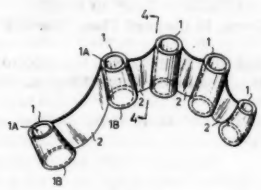
Masana Kosuge, Tokyo, Japan, assignor to Kosuge Planning Co. Ltd., Japan

Filed Jun. 26, 1984, Ser. No. 624,726

Claims priority, application Japan, Jun. 29, 1983, 58-99352[U]

Int. Cl.⁴ A63B *31/02*

U.S. Cl. 441—57 **3 Claims**



1. A swimming aid, comprising

a plurality of tubular members, each tubular member adapted to fit on a corresponding finger of a human hand and having a pair of ends, each of which is open, each of said tubular members having a central longitudinal axis, and

web-like members extending between adjacent ones of said tubular members, each of said web-like members having respective sides which mate with respective adjacent tubular members along respective joining lines, with the separate tubular members interconnected only by said web-like members, wherein

each of said web-like members is situated eccentrically with respect to the longitudinal axis of said tubular members between which it extends,

with one end portion of each respective joining line shaped to be situated closer to a back side of a proximal portion of the finger than the longitudinal axis of the joined tubular member, and

the opposite end portion of the joining line shaped to be situated closer to a front side of a tip portion of the finger than the longitudinal axis of the joined tubular member, when the tubular member is fitted on the corresponding finger.

4,548,589

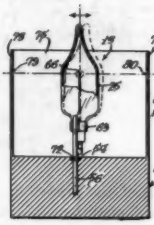
ARC TUBE AND PLASTIC REFLECTOR ASSEMBLY METHOD

William Mayer, and Alton E. Runions, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Jun. 28, 1982, Ser. No. 392,332

Int. Cl.[4] H01J *9/32*

U.S. Cl. 445—4 **17 Claims**



13. A method of making a lamp assembly with a mirrorized plastic reflector and a halogen bulb unit, including the steps of, forming a plastic reflector with a pair of spaced parallel bores therein, forming a pair of connector pins each with an end portion having a diameter substantially the same as a portion of the bores in the reflector and with a flange spaced substantially from the end thereof, attaching the pins to a halogen bulb, placing the pins in a holder and bending the halogen bulb or pins to align the bulb, applying an adhesive to the pin end portions, and thereafter inserting the pins into the reflector bores with adhesive entering the bores and with the pins in the bore end portions so the bulb unit is held rigidly in an aligned position while the adhesive sets.

4,548,590

CONSTRUCTION ELEMENT

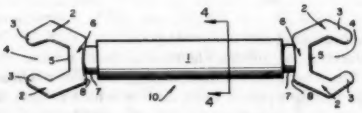
Anthony W. Green, 10 Cornwall Close, Warwick CV34 5HX, England

Filed May 16, 1984, Ser. No. 610,810

Claims priority, application United Kingdom, May 17, 1983, 8313507

Int. Cl.[4] A63H *33/06, 33/08*

U.S. Cl. 446—120 **13 Claims**



12. In a construction assembly, a construction element comprising:

a body member;

a coupling member of a flexible resilient shape-retaining material, the coupling member being generally U-shaped and having first and second axially extending jaws, and an end section for the coupling member axially spaced from the free end portions and joining the ends of the jaws and of the same width as the jaws, the jaws having free end portions parallel one to the other and transverse to the axis of the jaws and the end section and transverse to the axis of the jaws and the end section having a front surface facing the free end portions and a rear surface facing the free end portions and a rear surface facing away from the free end portions, said surfaces having spaced-apart side walls parallel one to the other and transverse to said axis and to said free end portions;

an intermediate member axially aligned with and joining said body member and coupling member and including a portion recessed relative to said body and coupling members, said recessed portion having a lesser cross-sectional dimension than the distance between the side walls, the lesser cross-sectional dimension of said recessed portion being no greater than the dimension between said free end portions of the jaw, the intermediate member having an axial length at least equal to the axial thickness of a free end portion; and whereby

the free end portions of the jaws of the element can flex resiliently over the side walls of another element to locate behind the rear surface of the other element to hold the elements against relative rotation about the element axis and relative movement along the element axis, the element being separable from said other element by pivoting of the element about one of its free end portions in a plane parallel to one including a free end portion of the other element to cause the other of its free end portions to flex resiliently over an associated side wall.

4,548,591

DOUBLE UNIVERSAL JOINT WITH AN ELASTICALLY YIELDABLE TORQUE TRANSMITTING ELEMENT

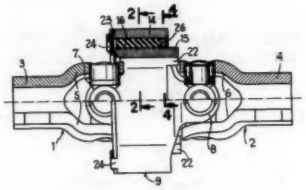
Bernard Haldric, and Sylvie Baudon née Chardon, both of Vendome, France, assignors to NACAM, Vendome, France

Filed Apr. 27, 1983, Ser. No. 488,994

Claims priority, application France, Apr. 30, 1982, 82 07571

Int. Cl.[4] F16D *3/00, 3/76, 3/32*

U.S. Cl. 464—89 **16 Claims**



1. A double universal joint comprising two end yokes, an intermediate connecting means comprising an outer member and an inner member and an elastically yieldable element interposed between said interconnecting the outer member and the inner member, each of said outer and inner members having a metal sheet-like wall and including, in one piece with the each member, a corresponding yoke, two spider elements pivotally connecting the corresponding yokes of the outer member and inner member to the two end yokes respectively, means for providing a rotational abutment of the inner member relative to the outer member and comprising at least one axial extension provided on said inner member and adapted to abut against a branch of the yoke of said outer member when the torque transmitted by the elastically yieldable element exceeds a predetermined value.

4,548,592

PULLEY CONSTRUCTION

Yasuo Ohhashi; Junichi Araki, and Yoshihiro Katsui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,763

Claims priority, application Japan, Dec. 24, 1981, 56-212710; Dec. 24, 1981, 56-212711

Int. Cl.[4] F16H *55/49*

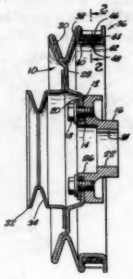
U.S. Cl. 474—168 **16 Claims**

1. A pulley of composite construction, comprising

a wheel having an inner attachment flange, a rim and a web extending between said inner attachment flange and said rim, said rim including a first outwardly extending annular wall formed of sheet material and a cylindrical rim member formed of sheet material, said first annular wall forming an acute angle with said cylindrical rim member and

said cylindrical rim member including first holes therethrough; and

a cylindrical ring adjacent said first annular wall and about



said rim member, said ring including a pulley surface having mechanical means for increasing purchase thereon and first tabs extending into said first holes in said rim member.

4,548,593

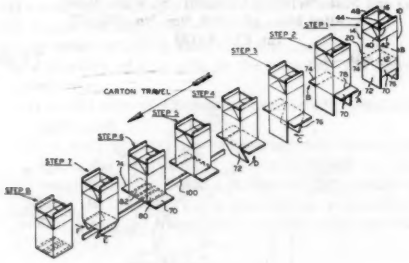
FOLDING CARTON FOR DRY POWDER

Steven Tisma, Niles, Ill., assignor to Tisma Machine Corporation, Chicago, Ill.

Division of Ser. No. 425,508, Sep. 28, 1982, Pat. No. 4,491,267. This application Aug. 1, 1984, Ser. No. 636,704

Int. Cl.⁴ B31B *13/14*

U.S. Cl. 493—56 **7 Claims**



1. A process for forming a dry powder box comprising the steps of:

(a) forming a blank having a surface with a plurality of spaced parallel score lines extending across said surface to enable it to fold to form a plurality of panels that come together to form a tube, the bottoms of a first pair of opposing panels of said tube having dependent therefrom a pair of relatively large dust flaps formed by cut lines which leave a small and controlled amount of bulk at the root of the cut, each of said dust flaps having a configuration conforming to the cross section of said tube, the bottoms of a second pair of opposing panels of said tube having dependent therefrom a pair of major flaps, each of said major flaps having a configuration extending over the entire width of and less than half of the length of the cross section of said tube;

(b) forming said flaps by said cut line extending across most of the width of said flap, the root of said cut line beginning with a taper in the thickness of the blank of about 15° to 40°, with respect to said surface;

(c) folding said dust flaps into said tube to occupy and stabilize the cross section of the tube, said bulk being scrunched up by said folding to fill any pin holes which might otherwise remain at the roots of the cut lines, said folded dust flaps overlying each other with at least a bead of glue between them; and

(d) folding said major flaps over said overlying dust flaps, with fields of glue distributed between the major flaps and their confronting dust flap.

4,548,594

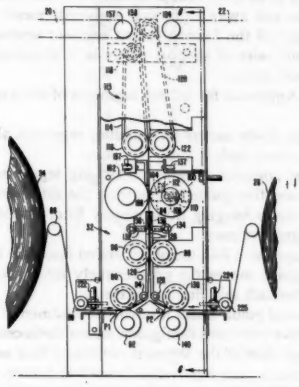
METHOD AND APPARATUS FOR SEVERING SHEETS OF MATERIAL

Walter E. Lotz, 6511 High Ridge Rd., Lantana, Fla. 33462

Filed Jul. 20, 1983, Ser. No. 515,513

Int. Cl.⁴ B26D *1/56*

U.S. Cl. 493—370 **12 Claims**



1. A method of severing sheets of material from a web of said material comprising:

feeding the web of material across an anvil having a hard surface;

crushing the web of material along a line extending across the width of said web by bridging a blade into engagement with the hard surface through the material with a knife edge sufficiently dull that the crushed material of said web tends to stick to said knife edge; and

transporting the sheets away from the blade.

4,548,595

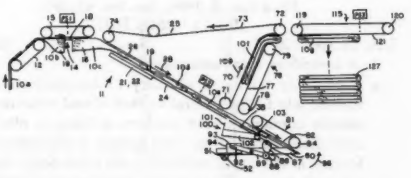
FOLDER

Charles P. Heater, Lake Lure, N.C., and Bruce H. Cooper, Fountain Inn, S.C., assignors to Opelika Manufacturing Corp., Chicago, Ill.

Filed Jul. 25, 1983, Ser. No. 516,652

Int. Cl.⁴ B31B *1/26*

U.S. Cl. 493—458 **12 Claims**



1. A method of folding segments of sheet material of varying lengths comprising moving segments in spaced series along their lengths in a direction parallel to their side edges along a first pair of rectilinear parallel support plates extending in a

downwardly sloped direction and later onto a second pair of rectilinear support plates in abutment with and coextensive with said first pair of support plates with conveyor means juxtaposed both said first and second pairs of support plates, and as the segments move supporting the longitudinally extending central portions of each segment on the support plates and progressively folding the longitudinally extending side portions beneath the central portions of each segment to form a French fold; and folding each French-folded segment across its length at a position on the segment which is one-half the distance between its leading and trailing ends as said position on the segment reaches the position of abutment of said second pair of support plates with said first pair of support plates, the step of folding comprising moving said second pair of support plates in an arc out of abutment with said first pair of support plates and away from said conveyor means and urging the portion of the French folded segment spanning the first and second pairs of support plates in a direction normal to said support plates.

4. Apparatus for folding segments of sheet material comprising

first guide means for guilding segments along a predetermined path,

first conveyor means for moving segments in series along said first guide means with the side portions of the segments hanging downwardly from opposite edges of the guide means,

progressive fold members angled inwardly beneath said first guide means for progressively folding the side portions beneath said first guide means,

second guide means normally in abutment with and coextensive with said first guide means for receiving the leading portion of the segment, with said first and second guide means being movable toward and away from abutment with each other,

second conveyor means for moving the segments onto said second guide means

means for moving said second guide means toward and away from aligned abutment with said first guide means and toward and away from said second conveyor means

a fold plate, means for moving said fold plate between said first and second guide means when said second guide means is moved away from said first guide means and said second conveyor means to fold the segments across their lengths.

4,548,596

CENTRIFUGE ROTOR AND METHOD OF ASSEMBLY

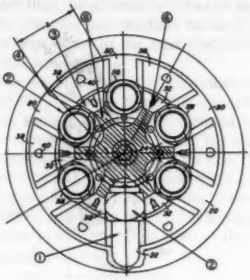
John H. Sutton, III, Belmont, and Steven J. Chulay, San Mateo, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 4, 1984, Ser. No. 616,643
Int. Cl.[4] B04B *5/02*
U.S. Cl. 494—20 **10 Claims**

1. A centrifuge rotor comprising:

a rotor body having a plurality of longitudinal recesses formed into the peripheral surface of said rotor to receive sample containers, said recesses defining a plurality of extending radial arms, and having a latitudinal recess formed in the upper surface of said rotor body defining a substantially vertical, inwardly directed, support shoulder in the upper surface of each arm;

and a pin structure secured to said rotor by fastening means and matably shaped with said support shoulder along the upper surface of each arm of said rotor for assembly on said rotor to provide a pivotal mounting for a sample container which provides radial support against outward



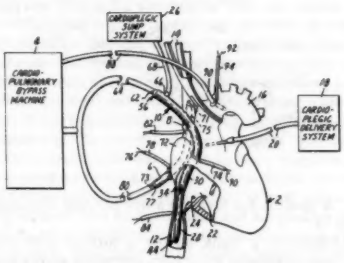
forces applied to said sample containers without stressing the fastening means.

4,548,597

DUAL CATHETER AND METHOD FOR SEPARATELY WITHDRAWING FLUIDS FROM THE HUMAN HEART

Duane M. Nelson, Waukesha, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 19, 1984, Ser. No. 590,637
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—43 **7 Claims**



1. A dual catheter assembly for separately withdrawing fluids from a vena cava and a right atrium of a human heart into extracorporeal circulation equipment, said assembly comprising:

a. first and second catheters, each of said catheters having an inlet opening, an outlet opening, a through passageway between said openings separated from the through passageway of the other catheter, and means adjacent said outlet opening for releasably coupling said outlet opening of said catheter to said extracorporeal equipment; and

b. a part of said second catheter adjacent said inlet opening of said second catheter attached to said first catheter with said inlet of said second catheter spaced a distance from said inlet opening of said first catheter so that said inlet openings of said first and second catheters can be simultaneously positioned in said vena cava and said right atrium, respectively.

4,548,598

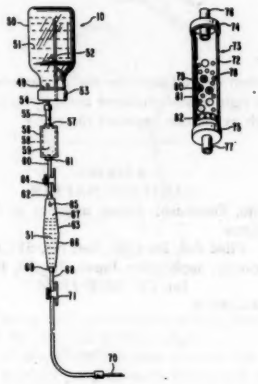
PARENTERAL AGENT DISPENSING EQUIPMENT

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 377,831, May 13, 1982, Pat. No. 4,439,183, which is a continuation-in-part of Ser. No. 310,047, Oct. 9, 1981, Pat. No. 4,511,353. This application Feb. 3, 1984, Ser. No. 577,241

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—85 **6 Claims**



1. A formulation chamber for use in a parenteral delivery system, comprising:

(a) a wall surrounding a lumen;

(b) an inlet for admitting a fluid into the chamber;

(c) an outlet for letting fluid leave the chamber; and

(d) a plurality of tiny pills in the chamber, the tiny pills comprising.

(1) a solid core of a beneficial parenterally administrable agent; and,

(2) a wall surrounding the parenterally administrable agent, the wall formed of a parenterally acceptable material that releases the parenterally acceptable agent from the tiny pills into a parenterally acceptable fluid that enters the formulation chamber and contacts the tiny pills.

4,548,599

PARENTERAL CONTROLLED THERAPY

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 325,206, Nov. 27, 1981, Pat. No. 4,432,756. This application Jan. 5, 1984, Ser. No. 568,457

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—85 **14 Claims**

1. an intravenous delivery system for administering an intravenously administrable beneficial agent formulation to an animal, the delivery system comprising:

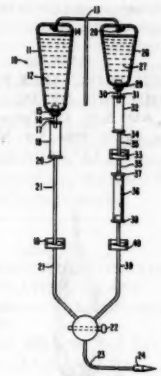
(a) a primary tube comprising means adapted for communicating with a reservoir of an intravenously acceptable fluid for the flow of an intravenously acceptable fluid therethrough;

(b) a secondary tube comprising means adapted for communicating with a reservoir of an intravenously acceptable fluid for the flow of an intravenously acceptable fluid therethrough;

(c) a formulation chamber in communication with the secondary tube, the formulation chamber comprising:

(1) means for introducing intravenously acceptable fluid from the secondary tube into the formulation chamber;

(2) means for supplying a beneficial agent to the intravenously acceptable fluid that enters the formulation chamber, said means comprising a pharmaceutically acceptable solid dosage form of the beneficial agent that release the beneficial agent for mixing with the intravenously acceptable fluid to provide an intravenously acceptable beneficial agent fluid formulation formed at



a rate controlled by the rate of fluid flow into the formulation chamber and by the rate of release of agent from the dosage form;

3 means for letting the intravenously acceptable beneficial agent fluid formulation leave the formulation chamber; and,

(d) means for receiving fluid from the primary tube and for receiving beneficial agent formulation from the formulation chamber for administering, when the delivery system is in operation, to an animal.

4,548,600

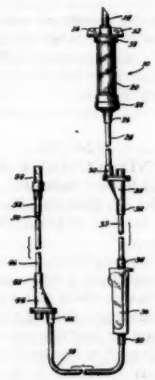
DRIP CHAMBER ASSEMBLY

Ricky R. Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 17, 1980, Ser. No. 131,265

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—122 **6 Claims**



1. A drip chamber assembly including a flexible plastic

chamber, an inlet, a drop former, the inlet communicating with the inside of the plastic chamber via the drip former, the improvement comprising:

said chamber having a length of about 1.75 inches to 2.25 inches, a uniform inside diameter throughout its length of about 0.45 inch to 0.55 inch, and a volume of about 0.278 cubic inch to 0.535 cubic inch;

said chamber being formed of a vinyl plastic material with a durometer reading of about 61 shore A to 81 shore A;

said vinyl plastic material having a thickness of about 0.04 inch to 0.08 inch; and

end caps rigidly supporting the ends of said chamber.

4,548,601

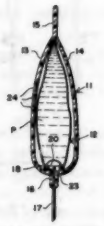
PREPACKAGED, INJECTABLE PHARMACEUTICAL AND HYPODERMIC NEEDLE COMBINATION

Banning G. Lary, 6225 S.W. 117 Terrace, Miami, Fla. 33156

Filed Apr. 9, 1984, Ser. No. 597,939

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—204 **6 Claims**



1. A prepackaged, injectable pharmaceutical hypodermic needle combination comprising a semi-rigid outer container, a relatively flexible, substantially non-resiliant inner container supported within said outer container and fixed relative thereto at one end of said outer container, a cannula extending through said outer container at said relatively fixed end thereof, said outer container being comparatively resiliant so as to resume its original shape after being manually collapsed, a premeasured dose of an injectable pharmaceutical contained within said inner container, air passage means in said outer container for permitting the flow of air into the cavity between said inner and outer containers, means for communicatively interconnecting the interior of said inner container with the inwardly-extending end of said cannula, said air passage means comprising an opening in one of the side walls of said outer container, said opening being adapted for closure and sealing off by convering with the thumb upon manual squeezing of said outer container in an injecting procedure whereby, upon successive squeezing operations of said outer container during an injecting procedure said inner container will become completely collapsed by pneumatic pressure to fully express the contained pharmaceutical being injected.

4,548,602

INTERCOSTAL TUBE

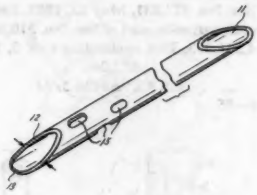
Edward M. Ring, 621 S. New Ballas Rd., St. Louis, Mo. 63141

Filed Jul. 27, 1983, Ser. No. 517,724

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—280 **2 Claims**

1. An intercostal tube of plastic material, the tube being of a size to enable drainage from a body cavity into which it is inserted, and being flexible about its longitudinal axis but relatively resistant to transverse crushing force; the tube having a sloping tip end portion for insertion into the body by way of a passage therein made such as one between the ribs; the end of the tube being blunted to reduce its tendency to bend or to snag body tissue during insertion, the sloping tip, when viewed transversely of the tube axis, extending in a single slope from a point on the surface of the tube toward the end of the tube and toward the opposite side of the tube but terminating short of the opposite side of the tube, leaving a continuous end that is blunted and that extends around the tube, and the blunted part



of which when viewed from the end of the tube, is arcuate and is relatively rigid against collapse upon being forced through a passage such as the one between the ribs.

4,548,603

SANITARY NAPKIN

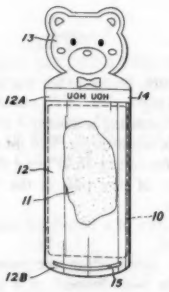
Teruko Ichijo, Funabashi, Japan, assignor to I.P.C. Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,323

Claims priority, application Japan, Jul. 28, 1982, 57-113469

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 R **4 Claims**



1. A sanitary napkin comprising:

an abosorbent pad for absorbing the flow from vagina;

a soft case for containing said absorbent pad therein, the outer surface of said soft case which does not contact a human body having an image pattern;

a patterned projection extended from one end of said soft case and bearing a symbolic pattern, said patterned projection being able to be folded; and

a slit formed in the other end of said soft case, so that the folded patterned projection can be inserted into said slit for fixed engagement with said patterned projection, in a manner that said symbolic pattern and said image pattern appear on the same side, said patterned projection being detechable from said slit.

4,548,604

ADJUSTABLE DIAPER

Laurett Ellsworth, 370 E. 400 South, Provo, Utah 84601

Filed Oct. 27, 1982, Ser. No. 437,039

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—399 **2 Claims**

1. A diaper garment for infants comprising:

an absorbent main body, having inner and outer faces with reference to an infant wearing said diaper, and providing a front flap panel, a rear flap panel, and a crotch panel comprised of a plurality of fabric layers attached to a top

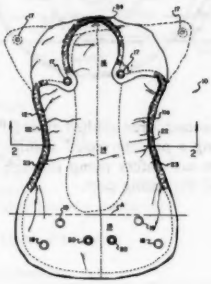
edge, bottom edge and side edges forming a perimeter of said layers;

a layer of fabric batting containing within the fabric layers of said main body, said batting being folded to provide a thickened center crotch panel;

elastic members sewn into the side edges and top edge of said main body, whereby the corners at the junctions of the side and the top edges are turned inwardly;

a male snap at the inner face of each corner at the junctions of the side and top edges;

a first pair of female snaps at the outer face with each snap



of said pair being each proximate a corner formed by the junctions of the side and bottom edges;

a second pair of spaced apart female snaps at the outer face and spaced inwardly and towards the crotch panel from the female snaps proximate the corners formed by the bottom and side edges; and

a third pair of spaced apart female snaps at the inner face proximate the top edge, the second pair of the female snaps being spaced closer together than the snaps of the first pair of female snaps and the third pair of female snaps being spaced closer together than the snaps of the second pair of female snaps.

4,548,605

METHOD FOR MANUFACTURING PLASTIC CONTAINER CONTAINING INFUSION SOLUTION WHICH DOES NOT ALLOW DETERIORATION OF INFUSION SOLUTION FOR LONG PERIOD OF TIME

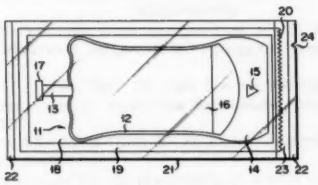
Tomiyuki Iwamoto, Tokyo; Naoki Hayakawa, Kashiwa; Haruo Honda, Kawasaki, and Teppei Maruyama, Komae, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,689

Claims priority, application Japan, Oct. 30, 1982, 57-191009

Int. Cl.[4] B65D *81/24*

U.S. Cl. 604—410 **19 Claims**



1. A method for manufacturing a plastic container containing an infusion solution which does not allow deterioration of the infusion solution over a long period of time, comprising the steps of:

providing a container which is made of a flexible plastic material having a heat resistance able to withstand heat of autoclaving sterilization and which holds an infusion solution containing components which may easily deteriorate upon contact with oxygen;

packaging the container hermetically within a first plastic packaging material having oxygen gas and steam permeabilities during autoclaving sterilization, and also having a heat resistance able to withstand the heat of autoclaving sterilization;

autoclaving sterilizing the container packaged in the first packaging material in an atmosphere of saturated steam containing substantially no oxygen by introducing the saturated steam through the first packaging material;

cooling the packaged and sterilized container, while substantially maintaining a pressure of autoclaving sterilization by introducing an inert gas into the atmosphere; and

further packaging the container, which is already packaged in said first packaging material, within a second packaging material which completely surrounds said first packaging material, said second packaging material having a high oxygen gas impermeability, said further packaging step being carried out without introducing an atmosphere surrounding the first packaging material into the space between the container and the first packaging material.

4,548,606

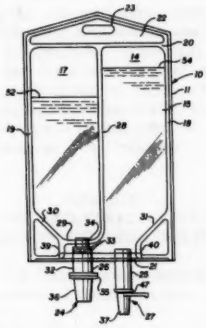
DUAL COMPARTMENTED CONTAINER WITH ACTIVATING MEANS

Mark E. Larkin, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 29, 1983, Ser. No. 537,190

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—414 **13 Claims**



1. A container system for separately storing and subsequently mixing the fluid contents of at least two compartments in the container comprising:

a container including wall means and a partition defining two separate compartments for different fluid materials, said partition including a secondary pierceable diaphragm portion;

an end wall closing a portion of said wall means, said end wall spaced from said partition;

fluid connecting means extending through said end wall and in fluid communication with said partition, said fluid connecting means further comprising:

a first tubular member having a primary pierceable diaphragm therein, said tubular member being in fluid-tight engagement with said partition and said secondary pierceable diaphragm;

a second tubular member positioned over said first tubular member, said second tubular member extending through said partition in said end wall, said first and second tubular members including apertures defining said passage means;

activating means operatively positioned in fluid-tight en-

gagement with said fluid connecting means, said activating means constructed and arranged to pierce both said diaphragm portions and provide fluid communication between said compartments through said passage means.

4,548,607

IMPLANTABLE MANUALLY ACTUATED MEDICATION DISPENSING SYSTEM

Donald L. Harris, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 13, 1983, Ser. No. 484,572
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—891 **17 Claims**

1. A dispensing system for dispensing a metered volume of fluid from a reservoir to a dispensing port, comprising:

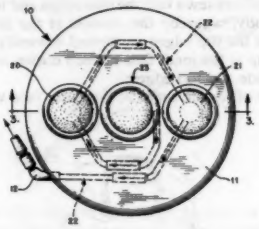
a housing;

a reservoir;

means within said housing defining a fluid circuit serially including a first check valve, a safety pump, a second check valve, a metering pump, and a third check valve;

said safety pump being operable in response to the application of a first force applied externally to said housing for advancing fluid through said second check valve to said metering pump; and

said metering pump being operable in response to the application of a second force applied externally to said housing for advancing a predetermined volume of said fluid advanced from said safety pump through said third check valve to said dispensing port.



4,548,608

DEPILATING COMPOSITION AND METHOD

Harley D. Swanson, Denver; Terry L. McAninch, Westminster, both of Colo., and J. Keith Conner, Bellevue, Wash., assignors to Birko Corporation, Westminster, Colo.

Filed Mar. 20, 1984, Ser. No. 591,445
Int. Cl.[4] C14C *1/06*; C07G *7/00*
U.S. Cl. 8—94.16 6 Claims

1. A method of removing hair from whole carcasses, skins, hides and pelts comprising

(1) applying to the carcass, skin, hide and pelt an effective amount of a composition comprising:

	Approx. Wt. (%)
Water	78.00–94.00
Alkali Hydroxide	2.00–6.00
Alkali Gluconate	0.10–0.50
Trisodium Phosphate	1.00–3.00
Triethanolamine Lauryl Sulfate or Sodium Lauryl Sulfate or both	0.50–2.00
Cocodiethanolamide	0.05–0.10
Sodium Metasilicate	0.50–0.20
Alkali, alkaline Earth or Ammonium Thioglycolate or a combination thereof	0.45–5.00
Triethanolamine Dodecyl Benzene Sulfonate	0.50–1.50
Alkaline Earth Hydroxide	1.00–4.00

(2) leaving the composition in contact with the hair to be removed for predetermined period of time at a predetermined temperature; and

(3) rinsing the composition and unwanted hair from the carcass, skin, hide or pelt with water.

4,548,609

METHOD FOR MARKING DEFECTS IN LEATHER

Alfred Schöne, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 12, 1984, Ser. No. 570,208
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300916
Int. Cl.[4] C14C *5/00*
U.S. Cl. 8—94.21 28 Claims

1. A method for marking a defect in leather which comprises applying to the entire surface of mineral tanned leather containing such a defect, prior to completion of the finishing of said leather, an anionic aqueous dispersion of a fluorescent organic pigment.

4,548,610

PROCESS FOR THE PREPARATION OF SOLID PHOTOACTIVATOR FORMULATIONS: SULPHONATED ZINC OR ALUMINUM PHTHALOCYANINE SOLUTIONS

Werner Preiswerk, Binningen, and Beat Bruttel, Böckten, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 19, 1984, Ser. No. 590,930
Claims priority, application Switzerland, Mar. 25, 1983, 1642/83
Int. Cl.[4] C09B *47/20, 67/54*; C11D *3/39*; D06L *3/12*
U.S. Cl. 8—101 24 Claims

1. A process for the preparation of a solid photoactivator formulation containing a sulfonated zinc or aluminum, phthalocyanine which comprises passing a crude solution containing said photoactivator, through a semipermeable asymmetrical membrane having a pore diameter of 1 to 500 Å and which consists of cellulose acetate which is modified by reaction with an ionic compound which contains hydroxyl-reactive groups, or which consists of polyacrylonitrile or a copolymer of acrylonitrile and another ethylenically unsaturated, monomer, and which is modified by reaction with hydroxylamine and subsequent reaction with a polyfunctional monomer selected from the group consisting of cyclic carbonimide halides, isocyanates, isothiocyanates and N-methlol compounds, then a polyfunctional polymer selected from the group consisting of polyethyleneimine, polyvinyl alcohol, polyvinylamine or polyvinyl aniline, and finally with an ionic compound which contains hydroxyl- or amino-reactive groups to yield a non-gelling concentrated activator solution and subsequently drying said concentrated photoactivator solution in a spray dryer, a grinder dryer or a fluidized-bed dryer.

4,548,611

METHOD AND APPARATUS FOR DYEING TEXTILE YARN SUBSTRATES BY IMPACTING A FOAM

James G. T. Paterson, 114 Forrest St., S., Lookout Mountain, Tenn. 37350, and Charles G. Whitener, Jr., P.O. Box 27578, Atlanta, Ga. 30327

Filed May 31, 1983, Ser. No. 499,293
Int. Cl.[4] D06P *7/00*
U.S. Cl. 8—477 7 Claims

1. A method for dyeing yarn, wherein said yarn is formed into a substrate and said substrate is moved relative to a dispensing means, said substrate including yarns laid transversely to the direction of movement of dye into said substrate, said method including the steps of foaming said dye to produce foamed dye for dyeing said substrate, dispensing a layer of said foamed dye from said dispensing means on at least one surface of said substrate, and impacting said layer of foamed dye on said substrate for causing said foamed dye to penetrate said substrate, traversing said substrate in a direction transverse to the direction of the yarns in said substrate, to be dispersed throughout the thickness of said substrate.

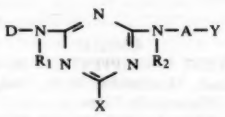
4,548,612

HALO-TRIAZINE AND VINYLSULFONE REACTIVE DYE COMPOSITION WITH BUFFER FOR STORAGE STABILITY

Yutaka Kayane, and Naoki Harada, both of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 18, 1984, Ser. No. 611,889
Claims priority, application Japan, May 27, 1983, 58-94469
Int. Cl.[4] C09B *67/24*
U.S. Cl. 8—524 10 Claims

1. A reactive dye composition of improved storage stability comprising (1) a dye having the formula,



wherein D is an organic dye residue having at least one sulfo group, R_1 and R_2 are independently a hydrogen atom or an unsubstituted or substituted lower alkyl group, A is an unsubstituted or substituted phenylene or naphthylene group, X is a halogen atom, and Y is a substituent selected from the group consisting of $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z$, in which Z is a group capable of being split by the action of an alkali, and (2) a buffer, the amount of the buffer being from 3 through 80% by weight based on the weight of the dye, and the pH

value of an aqueous solution prepared from the dye composition and water of 20 times as much as the weight of the dye composition being from 3.5 through 7.5.

4,548,613

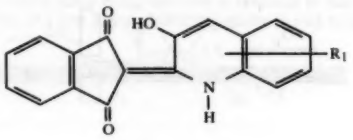
YELLOW DISPERSE DYESTUFF MIXTURES AND DYEING PROCESS

Albert Bode, Schwalbach, Fed. Rep. of Germany; Thomas V. Chambers, Rockhill, S.C.; Manfred Hähnke, Kelkheim, Fed. Rep. of Germany, and Wolfgang Kretzschmar, Charlotte, N.C., assignors to American Hoechst Corporation, Somerville, N.J.

Filed May 18, 1984, Ser. No. 612,186
Int. Cl.[4] C09B *29/36*
U.S. Cl. 8—638 **18 Claims**

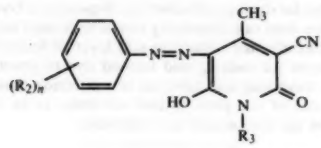
1. A dyestuff composition comprising a mixture of:

(1) 70–95 parts by weight of at least one yellow disperse dyestuff, designated as a Formula I type dyestuff, having the formula:



where R_1 is hydrogen or bromine;

(2) 5–13 parts by weight of at least one yellow disperse dyestuff, designated as Formula II type dyestuff, having the formula:



where: n=0, 1, 2, 3, 4 or 5;

R_2 is hydrogen when n=0 or is a substituent independently selected from halogen, cyano, nitro, trifluoromethyl, an alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, aliphatic carboxylate, aromatic sulfonate, aliphatic keto, aromatic keto, unsubstituted carboxyamide, aliphatic carboxyamide, unsubstituted sulfonamide, aliphatic sulfonamide, aliphatic sulfone or aromatic sulfone, when n=an integer of from 1 to 5; and

R_3 is hydrogen, alkyl of 1 to 6 carbons, alkyl of 1 to 6 carbons containing ethereal oxygen,, benzyl or phenethyl, wherein said parts by weight are calculated on 100 parts by weight of Formula I type and Formula II type dyestuff.

4,548,614

SOLVENT PRECIPITATION OF SALT

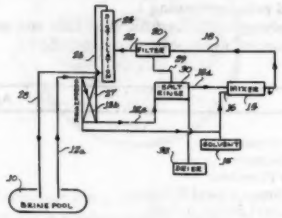
Donald T. Ireland, Minnetonka, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Filed Feb. 16, 1983, Ser. No. 467,159
Int. Cl.[4] C01D *3/04, 3/16*
U.S. Cl. 23—300 **10 Claims**

1. A process for extracting sodium chloride from a saturated brine solution comprising

selecting an organic solvent having a boiling point between about −10° C. and about 65° C., having a specific heat below about 0.7 cal/g°C., having a heat of vaporization below about 200 cal/g, being at least about 20 percent by weight soluble in water, either forming no azeotrope with water or forming an azeotrope with water containing less than about 2 percent by weight of said solvent, and precipitating at least about 0.15 gm of sodium chloride for each gm of solvent added,

mixing said brine solution with said organic solvent, said organic solvent being added to said brine in an amount and at a temperature to precipitate sodium chloride at a total energy expenditure for the process, as herein described, of



1300 cal/gm of sodium chloride or less, the addition of said solvent precipitating sodium chloride crystals forming a mixture of solvent and unsaturated brine,

filtering the sodium chloride from the mixture of solvent and unsaturated brine,

distilling the unsaturated brine-solvent mixture to recover the solvent, and

reusing the solvent in the process.

4,548,615

PROCESS FOR MANUFACTURING SOLID FUELS FROM HEAVY HYDROCARBON OILS AND VEGETABLE MATERIALS

Daniel Lonchamp, Tassin la Demi-Lune; Vong N. Hoai, Eybenes, and Francois-Pierre Navarre, Charbonniere les Bains, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 29, 1984, Ser. No. 625,886
Claims priority, application France, Jun. 30, 1983, 83 11049
Int. Cl.[4] C10L *5/44, 5/14*
U.S. Cl. 44—1 D **19 Claims**

1. A process for manufacturing a solid fuel composition, which process comprises admixing vegetable organic material with an oil-in-water macro-emulsion and drying the resultant composition, said oil being a hydrocarbon oil whose viscosity at 100° C. before incorporation of the oil into the emulsion is higher than 500 centistokes (1 stoke = $10^{-4}m^{2}/s$), the average size of the oil droplets of said macro-emulsion being from 0.5 to 20 micrometers and the ratio by weight of the oil of the macro-emulsion to the vegetable organic material being from 1:10 to 10:1, as dry weight, wherein said macro-emulsion is broken on contact with the vegetable organic material and said material is impregnated with the oil.

11. A process according to claim **1** comprising the further step of coating the dried composition with lime, asphalt, wax, combustion ashes or clay.

18. The process of claim **1** wherein the vegetable organic material comprises, dung, wood residue, garbage fractions or food wastes.

19. The process of claim **1** wherein the vegetable organic material comprises corn stalks, Jerusalem artichoke stalks, coffee grounds, bark, sawdust or lees of wine.

4,548,616

GASOLINE CONTAINING AS ADDITIVE POLY(OXYETHYLENE) POLY(OXYPROPYLENE) POLY(OXYETHYLENE) POLYOL TO REDUCE OCTANE REQUIREMENT INCREASE

Rodney L. Sung, Fishkill, and Marshall E. Davis, Poughkeepsie, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,656

Int. Cl.⁴ C10L *1/18*

U.S. Cl. 44—77 **19 Claims**

1. A fuel composition comprising

(i) a major portion of a liquid hydrocarbon fuel boiling in the gasoline boiling range; and

(ii) a minor effective amount, 0.06 w %–0.9 w % of as additive, of

$$HO(CH_2CH_2O)_a(CHCH_2O)_b(CH_2CH_2O)_cH$$
$$\quad\quad\quad

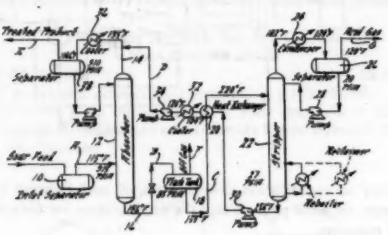
(f) removing the fifth and sixth process streams from the process.

4,548,620

PROCESS FOR TREATING NATURAL GAS

Ignacio B. Albiol, Houston, Tex., assignor to Key Engineering, Inc., Houston, Tex.

Filed Feb. 7, 1984, Ser. No. 577,776
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—48 **1 Claim**



1. A process for removing acidic contaminants such as carbon dioxide, hydrogen sulfide, and other sulfur compounds from sour gas feed stock to effect sweetening thereof comprising the steps of

removing carbon dioxide and hydrogen sulfide from the sour gas stream by contacting said stream at a first stage with an amine based chemical solvent in an absorber,

regenerating the solvent by removing the carbon dioxide and hydrogen sulfide therefrom in a reboil stripper column,

introducing the regenerated solvent under pressure to a partially sweetened gas stream emanating from the absorber at a second stage upstream of said absorber,

cooling the mixed partially sweetened gas and solvent stream sufficiently so that the resultant overall rate of carbon dioxide pickup is substantially constant or lowered, while the rate of hydrogen sulfide pickup is maintained constant or increased thereby to effect a lowering of the energy requirements in said stripper column,

separating the partially fouled solvent from the fully sweetened gas stream in an outlet separator,

removing the fully sweetened gas from said separator, and

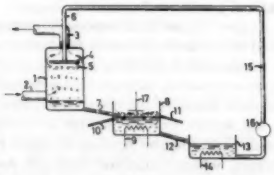
introducing the partially fouled solvent to the absorber for contacting with the sour gas feed stock.

4,548,621

CONDENSING ZINC VAPOR

Sune Eriksson; Börje Johansson, and Sven Santén, all of Hofors, Sweden, assignors to SKF Steel Engineering AB, Sweden

Continuation of Ser. No. 460,351, Jan. 24, 1983, abandoned. This application Feb. 6, 1985, Ser. No. 698,750
Claims priority, application Sweden, Jun. 21, 1982, 8203830
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—72 **16 Claims**



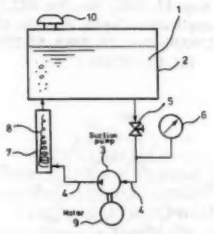
1. A method of recovering zinc from a gas containing zinc vapor comprising the steps of introducing said vapor into the lower portion of a first chamber having upper and lower portions, passing said vapor upwardly through the chamber, spraying atomized lead in liquid form into the chamber by nozzle means arranged such that the lead and vapor contact each other in counter current flow thereby condensing said vapor on droplets of the lead and thereby forming a liquid lead-zinc mixture, collecting the lead-zinc mixture at the bottom of the chamber and withdrawing said mixture from the chamber; thereafter passing said mixture to a separator and cooling said mixture in said separator such that the zinc forms a layer on the top of the lead, removing the zinc layer from the top of the lead by means of a first separator outlet, and removing the lead from a second separator outlet and recycling the lead from which the zinc has been removed back into the chamber.

4,548,622

DEVICE FOR SEPARATING DISSOLVED GASES AND ENTRAINED BUBBLES FROM LIQUID

Ryushi Suzuki, and Joji Yamaga, both of Tokyo, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 6, 1984, Ser. No. 597,258
Claims priority, application Japan, Apr. 12, 1983, 58-54354[U]
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—204 **1 Claim**



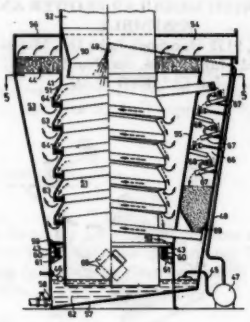
1. A device for separating dissolved gases and entrained bubbles from a liquid comprising a circulation passage connected to a liquid tank and including a suction pump, the liquid being withdrawn from said tank and circulated by said suction pump, throttle means in the circulation passage fluidically interposed between a suction port of said suction pump and said tank for producing a negative pressure on liquid withdrawn from said tank and decreasing the solubility of gases in the liquid flowing out of said tank and into the suction port of said suction pump to produce a negative pressure lower than a pressure at which gases are dissolved in the liquid, and supersaturating those gasses dissolved in that liquid whereby bubbles can be easily formed, and a bubble collector means in the circulation passage located fluidically downstream of a discharge port of said suction pump and fluidically upstream of said tank for receiving the liquid containing the supersaturated gases from said suction pump and collecting and growing bubbles whereby said bubble collector means cooperates with said throttle means for efficiently separating gases and bubbles from a liquid which has been withdrawn from said tank, said bubble collector means including a cylindrical housing having an inlet located at the bottom of said housing and an outlet located at the top of said housing for causing the liquid to flow tangentially and upwardly with pressure increasing from a first valve adjacent to said inlet to a maximum and then decreasing to a second value.

4,548,623

PERFORATED TROUGH CONDITIONING DEVICE

Marcel Naske, New Westminster, Canada, assignor to Helix Collector Syndicate, Vancouver, Canada

Filed Sep. 6, 1983, Ser. No. 529,515
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—233 **5 Claims**



1. A gas conditioning apparatus comprising:
(a) a hollow vertical substantially cylindrical structure comprising a surrounding helical outer wall and helical baffle and being closed at one end and open at the other end;
(b) a helical trough, having a receiving end and a discharge end and a permeable bottom, said trough being interposed between and connecting the helical outer wall and the helical baffle and supporting a layer of particulate;
(c) the helical baffle connected to the trough and the said outer wall so that substantially the only conduit to channel gas out of the cylindrical structure is through the permeable trough bottom;
(d) means for introducing a layer of particulate onto the receiving end of the trough;
(e) vibrating means for moving a layer of particulate along the trough from the receiving end to the discharge end thereof;
(f) means for transporting gas for conditioning into the cylindrical structure and through the permeable trough bottom and the layer of particulate thereon;
(g) means for applying a liquid to the layer of particulate along the trough to enhance conditioning of the gas;
(h) means for removing the layer of particulate from the trough;
(i) means for regenerating the particulate; and
(j) means for returning the particulate to the receiving end of the trough.

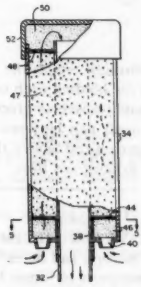
4,548,624

HYGROSCOPIC BREATHER CAP

James E. Waller, Madison, Tenn., assignor to Des Case Corporation, Madison, Tenn.

Continuation of Ser. No. 514,459, Jul. 15, 1983, Pat. No. 4,504,289. This application Jun. 21, 1984, Ser. No. 623,234
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—274 **10 Claims**

1. A hygroscopic breather cap for a liquid petroleum tank comprising:
an air impervious body closed at one end, having a standpipe aperture at the other end, and having a plurality of apertures open to the atmosphere adjacent said other end, said body having an air impervious standpipe communicating with said standpipe aperture at one end and being open at the other end at a point adjacent to but spaced from the closed end of said body to form an air impervious partition between a central passageway communicating with said standpipe aperture and a radially outer passageway communicating with said plurality of apertures, so that air entering said body through said plurality of apertures is forced by said standpipe to travel substantially the length of said body through said radially outer passageway into the open end of said standpipe, and then substantially the length of said body through said central passageway before exiting said central aperture;
a first fabric disposed within said radially outer passageway adjacent said plurality of apertures;
a second fabric disposed within said radially outer passageway adjacent the open end of said standpipe;
a volume of a granular desiccant substantially filling said radially outer passageway between said fabrics, said fabrics being of a type which will inhibit the passage of dust particles into said radially outer passageway and the passage of desiccant fines from said radially outer passageway into said central passageway; and



an air pervious foam member disposed within said body adjacent the closed end thereof in position so that air passing from said radially outer passageway into said central passageway passes therethrough,
whereby moist and dust-laden air entering said radially outer passageway passes through said first fabric where dust is removed, through said desiccant where moisture is removed, through said second fabric where desiccant fines are removed, and through said foam prior to entering the petroleum tank through said central passageway, to thereby reduce contamination of the liquid petroleum within the tank from dust and water and the attendant oxidation of the interior wall of the tank.

4,548,625

EXHAUST GAS CLEANING DEVICE FOR DIESEL ENGINES

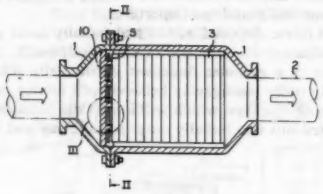
Yasuhiko Ishida, Mishima; Taiichi Mori, Susono; Shigeyuki Hikita, and Tamotsu Horiba, both of Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Jul. 11, 1984, Ser. No. 629,572
Int. Cl.[4] B01D *39/20*; F01N *3/02, 3/36*
U.S. Cl. 55—282 **7 Claims**

1. An exhaust particle cleaning device for a diesel engine comprising:
a trap case having a gas inlet and a gas outlet provided in a flow conduit for the flow of exhaust gas therethrough;
a filter material having an upstream end face disposed in said trap case adjacent said gas inlet so that carbon particles or other exhaust particles contained in the exhaust gas an are caught within said filter material when the exhaust gas passes through said filter material;
an electric heater comprising a plurality of heating elements spaced over the upstream end face of said filter material to define areas between said plurality of heating elements through which areas the exhaust gas passes;
each of said electric heater elements comprising a heating

wire or rod extending parallel to the upstream end face of the filter material;

means for supporting said heating elements comprising a plurality of heat-insulating arms extending parallel to and having faces adjacent the upstream end face of said filter material, a face of each arm having a plurality of transverse grooves through which the heating wires or rods pass, and means for holding each of said heating wires or rods in each of said transverse grooves so as to maintain a predetermined small gap between the heating wires or rods and the upstream end face of the filter material in the direction of the exhaust gas flow.



4,548,626

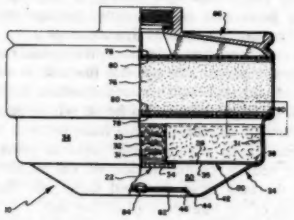
PARTICULATE AIR FILTER ASSEMBLY

Mark W. Ackley, E. Aurora, and Brian D. Szafranski, Lancaster, both of N.Y., assignors to Figgie International Inc., Willoughby, Ohio

Filed Apr. 30, 1984, Ser. No. 605,587

Int. Cl.[4] B01D *50/00, 46/10*

U.S. Cl. 55—316 **9 Claims**



1. A high efficiency particulate air filter assembly having low air flow resistance, said filter assembly comprising:

an annular filter element having a diameter in the range of 3.0 to 5.0 inches, the filter element being formed from a relatively thin filter media folded to provide a number of circumferentially spaced pleats, the fold lines of which extend radially relative to the axis of the filter element, the inner edges of the pleats being bonded together to define a central opening therein, the pleats having a height from 0.4 to 1.1 inches, and the number (N) of pleats being in the range, said range being defined by

$$N = \left(14d + \frac{5d}{\sqrt{h}}\right) \pm 20\%$$

where "d" is a numerical value equal to the diameter in inches, and "h" is a numerical value equal to the pleat height in inches;

closure means closing the central opening;

a canister shell of generally cup-shaped configuration having an apertured end face, an open end, and a generally cylindrical portion disposed between the end face and the open end, the filter element being received within said canister shell and having the outer edges of the pleats bonded to the inner wall surface of the cylindrical portion; and

an apertured cover, the peripheral edge of the cover being interconnected to said shell adjacent said open end whereby the filter element is enclosed within said canister shell.

4,548,627

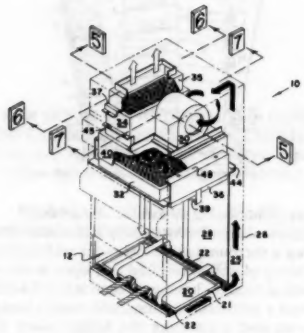
FUME HOOD WITH MODULAR BLOWER AND FILTER ASSEMBLY

Jerome J. Landy, 9175 Hammock Lake Dr., Miami, Fla. 33156

Filed May 1, 1984, Ser. No. 605,833

Int. Cl.[4] B08B *15/02*

U.S. Cl. 55—385 A **7 Claims**



1. In a bio hazardous fume hood having a frame, plenum, and work area comprising, in combination,

a blower motor assembly,

an exhaust transition,

said frame having an opening therein receiving the blower motor assembly,

an exhaust filter,

said frame having means for anchoring the exhaust transition, said exhaust transition having a lower portion positioned on top of the exhaust filter,

said frame having an exhaust filter shelf receiving and supporting the lower portion of the exhaust filter,

means for securing the exhaust transition to the frame,

a supply filter,

said frame having an interior shelf supporting the supply filter,

said blower motor assembly positioned on top of the supply filter and in communication with the plenum,

and means for securing the blower and said filter to a shelf in the fume hood for supporting the entire unit with the exhaust transition and the frame sandwiching the exhaust filter and supply filter.

4,548,628

FILTER MEDIUM AND PROCESS FOR PREPARING SAME

Masaaki Miyake, Ibaraki, and Kunihiko Fukumori, Takatsuki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Apr. 8, 1983, Ser. No. 483,253

Claims priority, application Japan, Apr. 26, 1982, 57-68812; Jul. 9, 1982, 57-118635; Jul. 9, 1982, 57-118636

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—487 **6 Claims**

1. A filter medium comprising one fibrous web or a plurality of piled and integrated fibrous webs, said web or webs being composed mainly of ultra-fine combustible synthetic fibers having a single fiber diameter of from 0.1 to 1.5μ, wherein the

constituent fibers are interlaced and entangled with one another in various directions and satisfy the following requirements:

(i) the fiber packing ratio α (%), which is defined by the following formula, is in the range of $20 \geqq \alpha \geqq 3$:

$$\alpha = \frac{\rho'}{\rho} \times 100$$

wherein ρ stands for the true density of the fibers and ρ' stands for the apparent density of the filter medium,

(ii) the ratio S_B/SA of the actually measured surface area S_B (m^2) of the constituent fibers per m^2 of the filter medium to the total surface area S_A (m^2) expressed by the following formula:

$$S_A = \frac{9000\pi\phi W}{d}$$

wherein d stands for the mean single fiber denier, ϕ stands for the mean single fiber diameter (m) and W stands for the basis weight (g/m^2) of the filter medium, is in the range of

$$1 > \frac{S_B}{S_A} \geqq 0.6, \text{ and}$$

(iii) the number N of single fibers piled in the thickness direction of the filter medium, which is expressed by the following formula:

$$N = \frac{\alpha l}{100\phi'}$$

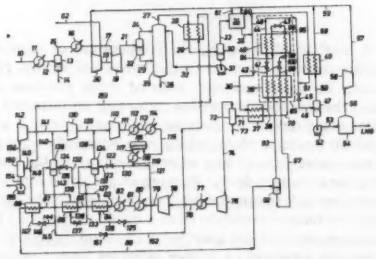
wherein α stands for the fiber packing ratio (%), l stands for the thickness (μ) of the filter medium and ϕ' stands for the mean single fiber diameter (μ), is in the range of $1000 \geqq N \geqq 40$ and wherein at least one surface of the filter medium is entirely covered with irregular fine depressions not uniform in shape.

4,548,629

PROCESS FOR THE LIQUEFACTION OF NATURAL GAS

Chen-hwa Chiu, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 11, 1983, Ser. No. 540,957
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—17 **11 Claims**



11. A process for liquefying natural gas comprising the steps of:

(a) supplying said natural gas at a pressure above about 600 psia (4137 kPa);

(b) expanding said natural gas in a turboexpander to reduce its temperature below about −40° F. (−40° C.);

(c) passing said natural gas through a demethanizer to remove the heavier components therefrom;

(d) precooling said natural gas, before substantial warming occurs, by at least three stages of heat exchange with a C_2 hydrocarbon refrigerant contained in a single refrigerant system;

(e) cooling a mixed refrigerant contained in a mixed refrigerant system by at least three stages of heat exchange with said C_2 hydrocarbon refrigerant, wherein said mixed refrigerant consists essentially of nitrogen, methane and a C_2 hydrocarbon; and

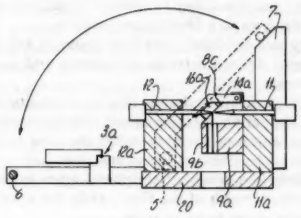
(f) liquefying said precooled natural gas by heat exchange with said mixed refrigerant in at least one cryogenic heat exchanger.

4,548,630

FIBRE FUSION SPLICING

Ryszard Biedka, Leeds, England, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 467,534, Feb. 17, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,106
Claims priority, application United Kingdom, Feb. 17, 1982, 8204678
Int. Cl.[4] C03B *29/00*
U.S. Cl. 65—2 **4 Claims**



1. Apparatus for joining the ends of two optical fibres comprising:

first and second spaced apart clamping means having first and second recesses, respectively, which are aligned axially for holding first and second optical fibres, respectively, in said first and second recesses by clamping the protective coatings of said fibres;

third and fourth clamping means positioned between said first and second clamping means and having third and fourth recesses, respectively, which are aligned axially for holding said first and second optical fibres, respectively, in said third and fourth recesses by clamping said fibres;

said first and second clamping means being pivotally mounted for movement about an axis parallel to the aligned axis of said fibres between a first position and a second position in which said four recesses are aligned along a common axis, said first and second clamping means being linked for pivotal movement together, and stop means for limiting the pivotal movement of said first and second clamping means to said second position;

means for moving said first and second optical fibres along said common axis to adjust the relative positions of the ends of said optical fibres which are to be joined; and

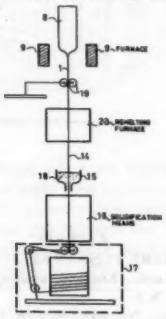
means located between said third and fourth clamping means for joining together said first and second optical fibres by fusing said ends.

4,548,631

PROCESS AND DEVICE FOR MANUFACTURING A FIBER KEEPING A CIRCULAR POLARIZATION

Hervé Arditty, Marly-le-Roy, and Philippe Graindorge, Magny-les-Hameaux, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,246
Claims priority, application France, Dec. 10, 1982, 82 20767
Int. Cl.[4] C03B *37/025*
U.S. Cl. 65—3.1 4 Claims



1. A process for manufacturing a glass fiber keeping circular polarization, comprising the steps of:

drawing a homgeneous glass fiber from a source containing molten glass,

allowing said glass fiber to solidify throughout, and conveying the fiber to a fiber take-up means,

twisting said solidified glass fiber about its axis uniformly in a region defined between said source and said fiber take-up means,

subjecting said twisted glass fiber to a remelting step where only the peripheral layer of said fiber is remelted along the entire length of the fiber, while the core of the fiber remains under twisting stress, and then

permitting said remelted peripheral layer to solidify along the entire length of the fiber, while the core of the fiber remains under twisting stress,

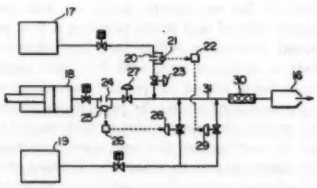
whereby said solidified peripheral layer is substantially free of twisting stresses, and the remaining twisting stresses are substantially borne by the core of said fiber.

4,548,632

PROCESS FOR PRODUCING FINE FIBERS FROM VISCOUS MATERIALS

Keihachiro Tanaka, Itami, and Shigekazu Yoshii, Nishinomiya, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 660,486
Claims priority, application Japan, Oct. 19, 1983, 58-195797
Int. Cl.[4] C03B *37/04*
U.S. Cl. 65—5 3 Claims



1. A process for producing fine fibers, which comprises

(1) allowing a viscous material to flow out from a flowout orifice,

(2) blowing a rectilinear first high-speed gas stream from each of at least three circumferentially spaced gas jet nozzles disposed around the flowout orifice to reduce abruptly the cross-sectional area of a first fine stream of the viscous substance that has flowed out, and to form a second fine stream of the viscous material having a reduced cross sectional area, said first high-speed gas stream having the following two vector components,

(A) a tangential component along the outer circumference of that section of said first fine stream of the viscous substance which crosses the axis of said first fine stream, and

(B) a component first gradually approaching the axis of said first fine stream in the flowing direction of the viscous material and then gradually moving away from said axis, and

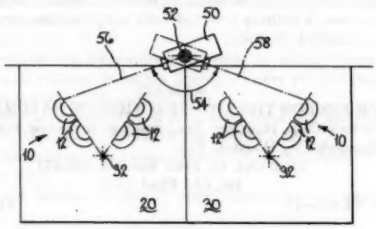
(3) blowing a second high-speed gas stream against said second fine stream of a reduced cross-sectional area from across the axis of the first fine stream of the viscous material at a position downstream of that position at which the first high-speed gas stream most approaches the axis of the first fine stream of the viscous material when viewed in the flowing direction of the viscous material, thereby to thin the second fine stream further.

4,548,633

DETECTING THE TEMPERATURE OF MOULDS OF A GLASSWARE FORMING MACHINE OF THE INDIVIDUAL SECTION TYPE

Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 31, 1984, Ser. No. 666,599
Claims priority, application United Kingdom, Nov. 16, 1983, 8330572
Int. Cl.[4] C03B *9/40*
U.S. Cl. 65—29 10 Claims



1. A method of detecting the temperature of moulds of a glassware forming machine of the individual section type by detecting infra-red radiation emitted from portions of the moulds, the method comprising mounting an infra-red radiation detecting device for turning movement about a vertical axis which lies in a plane which is substantially equi-distant from the centre-lines of two adjacent sections of the machine, turning the detecting device through an arc about said vertical axis between a first orientation thereof in which the device is arranged to receive radiation from a mould portion of a first of the adjacent sections and a second orientation thereof in which the device is arranged to receive radiation from a mould portion of a second of the adjacent sections, the detecting device being turned in timed relationship to the operation of the adjacent sections so that the detecting device is in its first orientation when the mould portion of the first section is in a mould-open position thereof and the detecting device is in its second orientation when the mould portion of the second section is in a mould-open position thereof, radiation detected by the detecting device, when it is in its first orientation, being used to determine the temperature of the mould portion of the first

section and radiation detected by the detecting device, when it is in its second orientation, being used to determine the temperature of the mould portion of the second section.

2. A glassware forming machine of the individual section type comprising a plurality of sections each of which comprises at least one mould arrangement by which mould portions are moved, in the operation of the section, between mould-open and mould-closed positions thereof to open or close at least one mould in which molten glass is moulded, and detecting means operable to detect the temperature of mould portions by detecting infra-red radiation emitted thereby, the detecting means comprising at least one infra-red radiation detecting device mounted for turning movement about a vertical axis which lies in a plane which is substantially equi-distant from the centre-lines of two adjacent sections of the machine, and turning means operable to turn the detecting device through an arc about said vertical axis between a first orientation thereof in which the device is arranged to receive infra-red radiation from a mould portion of a first of the adjacent sections so that the temperature of the mould portion can be determined from the radiation received by the device, and a second orientation thereof in which the device is arranged to receive infra-red radiation from a mould portion of a second of the adjacent sections so that the temperature of the mould portion can be determined from the radiation received by the device, the turning means being operable in timed relationship with the operation of the adjacent sections so that the device is in its first orientation when the mould portion of the first section is in a mould-open position thereof and the device is in its second orientation when the mould portion of the second section is in a mould-open position thereof.

4,548,634

MOLD AND METHOD FOR PRODUCING MOLDED GLASS ARTICLES

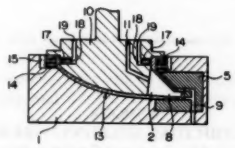
Kazuo Shibaoka, Itami; Shunji Onishi; Takao Miwa, both of Nishinomiya, and Toshio Akimoto, Kawanishi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 587,003, Mar. 7, 1984, abandoned. This application Dec. 28, 1984, Ser. No. 685,973

Claims priority, application Japan, Mar. 9, 1983, 58-38748; Sep. 28, 1983, 58-179767; Oct. 24, 1983, 58-198667

Int. Cl.[4] C03B *11/07*

U.S. Cl. 65—79 **13 Claims**



1. A mold for producing a glass article having an opening and a protruding hollow portion which, in a front elevation of the glass article as viewed from said opening, is either hidden or shown to protrude outwardly of the open circumferential wall portion of the glass article defining said opening, said mold comprising

(A) a female mold comprised of a main female mold member having a depressed portion and an auxiliary female mold member having a depressed portion, the inside shape of the depressed portion of the main female mold member substantially defining the outside shape of the glass article excepting said protruding portion, the inside shape of the depressed portion of the auxiliary female mold member substantially defining the outside shape of said protruding portion of the glass article, and said main and auxiliary female mold members being positioned in such a relationship that their depressed portions can be coupled to each other at the time of molding the glass article,

(B) a male mold defining the inside shape of that part of the glass article which corresponds to its outside shape defined by the main female mold member, and

(C) a gas exhaust port formed at an inmost position of the depressed portion of the auxiliary female mold member for discharging gases from said depressed portion, and/or

(D) a gas introducing port formed in the male mold in such a position that it faces the depressed portion of the auxiliary female mold member when the male mold is inserted into the main female mold member.

9. A method for producing a glass article having an opening and a protruding hollow portion which, in a front elevation of the glass article as viewed from its opening, is either hidden or shown to protrude outwardly of the open circumferential wall portion of the glass article defining said opening, said method comprising

(1) charging a predetermined amount of molten glass mass into a depressed portion of a main female mold member of a female mold, said female mold being comprised of the said main female mold and an auxiliary female mold which also has a depressed portion, the said charging being conducted when the depressed portion of the main female mold and the depressed portion of the auxiliary female mold are not coupled,

(2) press-molding the molten glass mass in the depressed portion of the main female mold by the male mold to define the outside and inside shapes of that part of the glass article which is substantially other than said protruding hollow portion,

(3) positioning the auxiliary female mold member at a position at which its depressed portion is coupled to the depressed portion of the main female mold member, and

(4) thereafter sucking and discharging gases from the depressed portion of the auxiliary female mold member through a gas exhaust port formed at an inmost position of said depressed portion and/or introducing a gas thereinto through a gas introducing port provided in the male mold at a position facing the depressed portion of the auxiliary female mold member, whereby the outside shape of that part of the glass article which substantially corresponds to its protruding hollow portion is defined by the inside shape of the depressed portion of the auxiliary female mold.

4,548,635

COOLING ARTICLES OF NEWLY MOULDED GLASSWARE

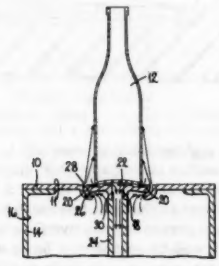
Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 31, 1984, Ser. No. 666,600

Claims priority, application United Kingdom, Nov. 16, 1983, 8330571

Int. Cl.[4] C03B *35/12*

U.S. Cl. 65—84 **8 Claims**



1. method of cooling a newly-moulded article of glassware,

the method comprising positioning the article on a substantially horizontal upper surface of a dead plate, the upper surface having a central opening therein and a plurality of grooves or openings formed in the upper surface around the central opening, the article being positioned so that the central opening is beneath the central region of the bottom of the article and each of the grooves or openings extends from beyond the article to beneath the bottom of the article, the method also comprising sucking air through the central opening so that the air is sucked through the grooves or openings into the central opening and the air flows past the bottom of the article, and blowing air on to sidewalls of the article through a plurality of nozzles which are substantially uniformly spaced around the article so that air is caused to flow past the sidewalls.

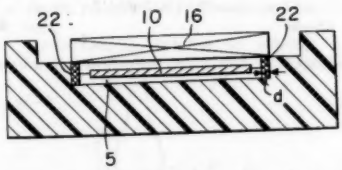
4. A dead plate arrangement for a glassware manufacturing machine, the arrangement comprising a dead plate having a substantially horizontal upper surface on which newly-moulded articles of glassware can be positioned for cooling, the upper surface having a central opening therein and a plurality of grooves or openings formed in the upper surface around the central opening, the grooves or openings being so arranged that, when an article of glassware is positioned on the upper surface so that the central opening is beneath the central region of the bottom of the article, each of the grooves or openings extends from beyond the article to beneath the bottom of the article, the arrangement also comprising suction means operable to suck air through the central opening in the dead plate so that, when an article is positioned as aforesaid, the suction means is operable to suck air through the grooves or openings into the central opening so that the air flows past the bottom of the article, and blowing means operable, when an article is positioned as aforesaid, to blow air on to sidewalls of the article through a plurality of nozzles which are substantially uniformly spaced around the article so that air is caused to flow past the sidewalls.

4,548,636

PROCESS FOR PRODUCING A FLAT GLASS ON A MOLTEN METAL BATH

Koji Nomaki; Hiroshi Mase; Yasuo Sato, and Motoichi Iga, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,532
Claims priority, application Japan, Jul. 7, 1983, 58-122369
Int. Cl.[4] C03B *18/16*
U.S. Cl. 65—99.2 **7 Claims**



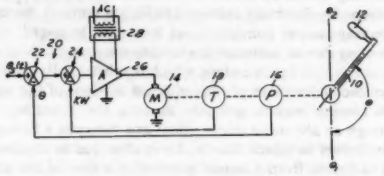
1. A process for producing a flat glass, which comprises withdrawing a glass ribbon substantially horizontally from the surface of a molten metal bath while maintaining the level of the surface of the molten metal at a level higher than an end wall at the outlet of the bath from which the glass ribbon is withdrawn and preventing the overflow of the molten metal from the end wall by means of a force induced by a linear induction motor, wherein side walls at the outlet of the bath are made of an electroconductive material thereby to prevent a drop of the induced force in the vicinity of the side walls.

4,548,637

SERVO-CONTROL OF MACHINE MOTIONS IN MANUFACTURE OF GLASS CONTAINERS

Peter S. Miller, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 30, 1984, Ser. No. 645,639
Int. Cl.[4] C03B *7/16*
U.S. Cl. 65—163 **5 Claims**



1. In a system for manufacture of glass containers, a servo system for controlling oscillatory motion of a member between predetermined end points θ_1 and θ_2, said system comprising a motor coupled to propel said member between said end points, a transducer coupled to said member to provide a signal indicative of actual member position θ, and servo amplifier means for energizing said motor as a function of a difference between said actual position signal θ and a second signal $\theta_s(t)$ indicative of desired member position, means for providing said second signal $\theta_s(t)$ comprising

memory means having stored therein a sequence of signals f(t) indicative of desired motion of said member along a preselected motion trajectory between trajectory end points θ_i and θ_f, said signals being stored as incremental functions of time t,

means for electronically translating said trajectory end points θ_i and θ_f to correspond with said predetermined end points θ_1 and θ_2,

means including an oscillator for periodically accessing said memory means to provide sequential signals f(t) indicative of incremental desired position along said trajectory, and

means responsive to said sequential signals f(t) and to said electronically translating means for directing said sequential signals $\theta_s(t)$ as a function thereof to said servo amplifier means on said second input.

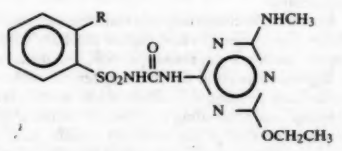
4,548,638

HERBICIDAL SULFONYLUREAS

Larry H. Hageman, Claymont, and Gerald A. Roy, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1983, Ser. No. 525,506
Int. Cl.[4] C07D *251/52*; A01N *43/70*
U.S. Cl. 71—93 **16 Claims**

1. A compound of the formula



wherein

R is CO_2CH_3, $CO_2CH_2CH_3$, or OSO_2CH_3.

4,548,639
N-ACYL-PIPERIDONE KETAL COMPOUNDS AND THEIR USE AS ANTIDOTES FOR PROTECTING CROP PLANTS FROM HERBICIDAL DAMAGE

Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen; Wilfried Faust, Odenthal, and Uwe Priesnitz, Unna-Massen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

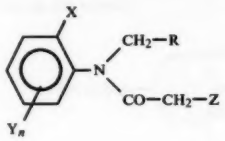
Continuation of Ser. No. 166,281, Jul. 7, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,801

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930449

Int. Cl.[4] A01N *25/32*

U.S. Cl. 71—94 12 Claims

1. Method for the protection of crop plants from damage by herbicidally active acetanilides of the formula



(VIII)

in which

R is pyrazol-1-yl,

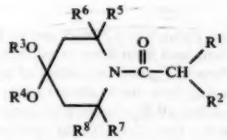
X and Y are identical or different and represent alkyl with 1 to 4 carbon atoms,

Z is chlorine and

n represents 0 or 1, and

herbicidally active acid-addition salts and metal salt complexes thereof,

which method comprises applying to the plants or their habitat an antidotally effective amount of an N-acyl-piperidone ketal compound of the formula



(I)

wherein

R^1 is a alkyl with from 1 to 4 carbon atoms or chlorine;

R^2 is chlorine;

R^3 and R^4 together represent an alkylene chain of 2 to 3 carbon atoms; and R^5, R^6, R^7 and R^8 are hydrogen.

4,548,640
ALLYLTHIODIPHENYL ETHER HERBICIDES

Elsayed A. Aly, Holland, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 21, 1983, Ser. No. 544,321

Int. Cl.[4] A01N *31/08;* C07C *149/34*

U.S. Cl. 71—98 4 Claims

1. The compound 3-allylthio-4-nitrophenyl 2-chloro-4-trifluoromethylphenyl ether.

3. A method for controlling undesired broadleaf plant growth which comprises applying to the locus where control is desired an herbicidally effective amount of the compound of claim 1.

4,548,641
HERBICIDES: N,N-DIALKYL-2-(4-SUBSTITUTED-1-NAPHTHOXY) PROPIONAMIDES

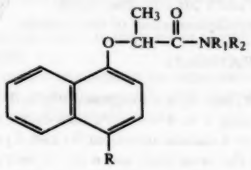
Francis H. Walker, Mill Valley, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 441,701, Nov. 15, 1982, abandoned. This application May 25, 1983, Ser. No. 497,928

Int. Cl.[4] C07C *103/26, 103/76;* A01N *37/18*

U.S. Cl. 71—118 25 Claims

1. A compound having the formula



in which R is chloro, fluoro, bromo, methyl, or methoxy and R_1 and R_2 are each C_1–C_4 alkyl.

23. A method of controlling grassy weeds comprising applying to the grassy weeds or the locus thereof a herbicidally effective amount of a compound according to claim 1.

4,548,642
PROCESS FOR PREPARING ZINC POWDER FOR ALKALINE BATTERIES (V)

Wolfgang Glaeser, Goslar, Fed. Rep. of Germany, assignor to Grillo-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,941

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311920

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 B 8 Claims

1. A process for preparing a zinc powder having a low gas evolution in an alkaline electrolyte for use in an alkaline battery by alloying the zinc with other metals,

comprising alloying the zinc with from 10 ppm to 5% by weight lead and cadmium, thallium, and indium;

wherein the added metals are used in amounts of cadmium of from 2 ppm to 5% by weight, of thallium of from 10 ppm to 5% by weight, and of indium of from 2 ppm to 5% by weight, the total amount of cadmium, thallium, and indium being not more than 10% by weight, based on the weight of the alloy; and

atomizing the alloy to form a powder, the particle sizes being between 70 and 600 μm.

4,548,643
CORROSION RESISTANT GRAY CAST IRON GRAPHITE FLAKE ALLOYS

Bruce A. Betts, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 20, 1983, Ser. No. 563,583

Int. Cl.[4] C22C *37/10*

U.S. Cl. 75—124 3 Claims

1. A low cost, corrosion resistant, high strength gray cast iron flake graphite alloy suitable for downhole use, consisting essentially of, by weight, 2–9% aluminum, 1–5% nickel, 0.5–2.5% chromium, 0.25–1.5% molybdenum, 0.5–2% silicon, 0.25–1.2% manganese, 2.4–4% carbon, 0–2% copper, 0–0.75% tin, 0–0.5% vanadium, 0–0.3% boron, and the remainder iron.

4,548,644

ELECTROLESS COPPER DEPOSITION SOLUTION

Akishi Nakaso, Oyama; Kiyoshi Yamanoi, Shimodate; Toshiro Okamura, Shimodate, and Yoshiyuki Tsuru, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,057

Claims priority, application Japan, Sep. 28, 1982, 57-169250; Sep. 28, 1982, 57-169251

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 106—1.23 **12 Claims**

1. An electroless copper deposition solution comprising

(a) cupric ions, a complexing agent for cupric ions, a reducing agent and a pH adjusting agent,

(b) a polyoxyethylene ether of the formula:

$$R_1O—CH_2CH_2O)_nR_2$$

wherein R_1 and R_2 are independently hydrogen, an alkyl group having 1 to 4 carbon atoms or an alkenyl group having 1 to 4 carbon atoms but R_1 and R_2 cannot be hydrogen at the same time; and n is 2 or more, and

(c) at least one member selected from the group consisting of an inorganic cyanide and α,α′-dipyridyl.

4,548,645

LITHOGRAPHIC WATER BASED FOUNTAIN SOLUTION CONCENTRATES

Bernard A. Thiebaut, Villiers, Me., assignor to Inmont Corporation, Clifton, N.J.

Filed Dec. 21, 1983, Ser. No. 597,798

Int. Cl.⁴ C09K *3/18*

U.S. Cl. 106—2 **15 Claims**

1. In a water dilutable concentrate for use in lithographic fountain solutions containing water, a buffer, a polyol and a surfactant the improvement comprising,

as the buffer, at least on salt of (a) a polycarboxylic acid and (b) an organic amine, wherein the polycarboxylic acid has a pK_a between about 3 and about 6, the organic amine has a pK_b between about 2 and about 9, and the concentrate when mixed in an amount of about 1% to about 6% by weight with water yields a fountain solution having a pH between about 4.7 and about 5.3, a surface tension between about 32×10^{-3} Newton/m and about 52×10^{-3} Newton/m, and a sufficient buffer effect such that the pH variation of the fountain solution will be less than about one pH unit when 5 cc of decinormal NaOH or 5 cc of decinormal HCl is added to 100 cc of the fountain solution.

4,548,646

THIXOTROPIC COATING COMPOSITIONS AND METHODS

Mark F. Mosser, Sellersville, and William J. Fabiny, Harleysville, both of Pa., assignors to Sermatech International Incorporated, Limerick, Pa.

Filed Nov. 15, 1982, Ser. No. 441,754

Int. Cl.⁴ C09D *5/10*

U.S. Cl. 106—14.12 **37 Claims**

1. An acid and stable thixotropic coating composition especially suitable for dipspin application which comprises (a) an acid binder aqueous solution which comprises phosphate ions and ions of the group of chromate ions or molybdate ions, and (b) an acid-stable, non-colloidal amorphous silica and (c) a nonionic surfactant, which composition is in a gel state when not subject to movement and in a liquid state when subject to movement.

4,548,647

METHOD FOR IMPROVING THE FILTERABILITY OF A VISCOSE SOLUTION

Karl B. G. Alvryd; Leif E. Elsby, both of Stenungsund, and Hans I. Uneback, Ödsmål, all of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed May 4, 1984, Ser. No. 607,339

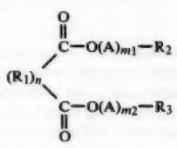
Claims priority, application Sweden, May 5, 1983, 8302564

Int. Cl.⁴ C08L *1/24*

U.S. Cl. 106—164 **9 Claims**

1. A process for improving the filterability of a viscose solution which comprises adding to the viscose solution an amount sufficient to improve the filterability within the range from about 0.01 to about 1% by weight calculated on the weight of the cellulose of a compound selected from the group consisting of

(1) compounds having the formula:



where n is 0 or 1; R_1 is a hydrocarbon group having from one to about twenty carbon atoms; A is an alkyleneoxy group having alkylene groups having from two to four carbon atoms, provided that at least 50% of the alkyleneoxy groups are ethyleneoxy groups; m_1 and m_2 are numbers from 0 to 30, the total of m_1+m_2 being within the range from 2 to about 60; R_2 and R_3 are selected from the group consisting of hydrogen and hydrocarbon groups having from one to twenty-four carbon atoms provided that not more than one of R_2 and R_3 is hydrogen; and

(2) compounds having the formuls:

$$R_4(O(A)_{m3}R_5)_n$$

where R_4 is an aliphatic group having from one to about twenty-four carbon atoms, and from none to two nitrogen atoms; R_5 is selected from the group consisting of hydrogen and acyl groups having from one to about twenty-four carbon atoms, provided that all R_5 are not simultaneously hydrogen; m_3 is a number from 0 to 30, the total of m_3 being a number from 2 to 100; n is a number from 2 to 6 and A has the meaning given in formula I.

4,548,648

THICKENING AGENT FOR PASTE

Yoshiyuki Shimohiro, Sakai; Masazo Ogawa, Uji, and Tooru Ohnishi, Nishinomiya, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 1, 1984, Ser. No. 616,378

Claims priority, application Japan, Jun. 2, 1983, 58-99115

Int. Cl.⁴ C08L *5/00*

U.S. Cl. 106—208 **3 Claims**

1. A thickening agent for a paste which comprises a hydroxyalkylated-carboxymethylated product of a tamarind seed powder or a tamarind gum, the product satisfying the following equation (I):

$$y\cong6.6-26.4x+35.1x^2-15.6x^3 \quad (I)$$

wherein y is the average degree of substitution of hydroxyalkyl group per saccharide unit and x is the average degree of substitution of carboxymethyl group per saccharide unit, provided that y and x fall within the following ranges:

$$0<y<2$$

$0<x<2$.

4,548,649

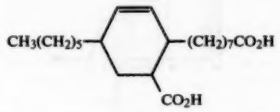
FOAMING AGENT

Edmund M. Choy, Columbia, Md., and Mark E. Baran, Blooming Grove, N.Y., assignors to Westvaco Corporation, New York, N.Y.

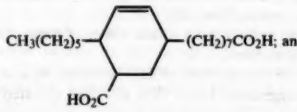
Filed Nov. 23, 1983, Ser. No. 554,675
Int. Cl.[4] C08L *3/00*
U.S. Cl. 106—213 **6 Claims**

1. In a composition suitable for surface application to a fibrous substrate, said composition bejng a foam produced by the aeration of an aqueous solution containing starch dispersed in water and about 3% by weight of a foaming agent based on the amount of starch in solution comprising the mixture of:

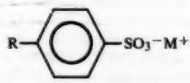
(a) from about 50–90% of a C_{21} dicarboxylic acid having the two major isomers



and



(b) from about 10–50% of an alkylarylsulfonate compound having the formula:



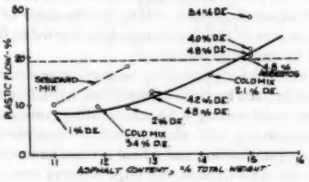
wherein M is selected from the group consisting of Na or K and R is dodecyl, said mixture reacting synergistically to produce a lower foam density than would be expected from the combination of ingredients.

4,548,650

DIATOMITE-MODIFIED ASPHALT MEMBRANES AND SLURRY SEALS

John H. Kietzman, Golden, Colo., assignor to Manville Service Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 457,984, Jan. 14, 1983, , which is a continuation-in-part of Ser. No. 343,075, Jan. 27, 1982,. This application Aug. 12, 1983, Ser. No. 522,871
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—281 R **6 Claims**



1. An improved aqueous cold mix slurry seal made from fine aggregate, a filler and an asphalt emulsion, said slurry seal pavement comprising in the range of 9 to 14% by weight of the mix is residual asphalt, in the range of 0.5 to 3.0% by weight diatomite filler and in the range of 90.5 to 83% by weight fine aggregate of which 70 to 100% passes no. 8 (No. 10) mesh sieve, said mix having a diatomite/asphalt ratio in the range of 0.08 to 0.30.

5. A process for preparing a diatomite modified slurry seal mix including an asphalt emulsion, diatomite filler and a fine aggregate; the addition of the diatomite requiring extra water in addition to that contained in said emulsion of an amount at least equal to between 2 and 4 times the weight of diatomite added to the mix, the steps comprising

(a) mixing at least most of the added water with the aggregate;

(b) adding the diatomite to the pre-wet aggregate and mixing it therewith;

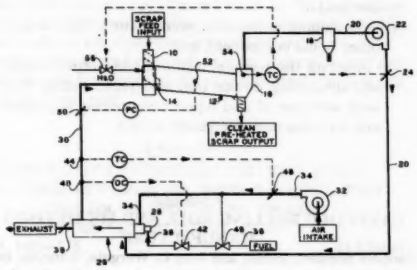
(c) adding asphalt emulsion to the aggregate/filler mix and mixing said asphalt therewith until complete coating of the aggregate/filler is achieved.

4,548,651

METHOD FOR RECLAIMING CONTAMINATED SCRAP METAL

Everett M. Ramsey, Richland, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 488,923, Apr. 27, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 682,818
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—11 **11 Claims**



1. A method of reclaiming metal contaminated with hydrocarbon combustibles, said method comprising the steps of:

feeding particles of said contaminated metal into a kiln;

vaporizing the hydrocarbon combustibles by heating said particles in said kiln in a hot gas atmosphere having a temperature and oxygen level sufficient to provide partially unburned hydrocarbon fumes and clean and relatively unoxidized metal;

discharging the clean metal from the kiln;

transporting the fumes in the kiln to a heat generating means having a burner means secured therein, said burner means being supplied with fuel and air;

providing hot gas in said heat generating means by firing said burner and incinerating said fumes;

recirculating said hot gas to the kiln to provide said hot gas atmosphere;

regulating the firing rate of the burner means to maintain the temperature of the hot gas being recirculated close to a predetermined point; and

varying the ratio of air to fuel being supplied to the burner means by adjusting the quantity of said fuel being supplied to the burner means in response to sensed changes in the oxygen concentration of the recirculated hot gas to maintain the oxygen concentration of the hot gas being recirculated close to a predetermined level.

4,548,652

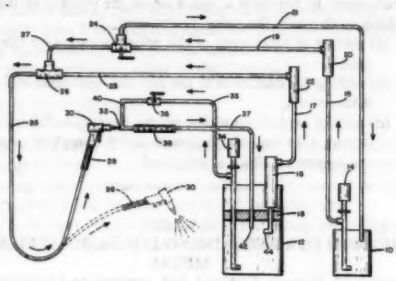
METHOD OF PURGING A PLURAL COMPONENT MIXING AND DISPENSING SYSTEM

Lawrence S. Kelly, Bolingbrook; Marty P. McCormick, Palatine, and William A. Weikel, Hanover Park, all of Ill., assignors to Graco Inc., Minneapolis, Minn.

Division of Ser. No. 529,346, Sep. 6, 1983, Pat. No. 4,522,789. This application Nov. 26, 1984, Ser. No. 674,942

Int. Cl.[4] B01F *5/05;* **B08B** *9/02*

U.S. Cl. 134—22.12 **3 Claims**



1. A method of purging two mixed liquid components from a dispensing device and feed line, comprising the steps of

(a) shutting off one of said liquid components while permitting said other liquid component to flow into said feed line; and

(b) developing a separate, recirculating flow loop of said other liquid component, and

(c) injecting the residual mixed liquid output stream from said dispensing device into said recirculating flow loop until said one of said liquid components is purged from said feed line and dispensing device.

4,548,653

CAST COLD ROLLING ROLL AND ITS METHOD OF MANUFACTURE

Jacques Bocquet, Sedan, and Jean C. Werguin, Ronchin, both of France, assignors to Union Siderurgique du Nord et de L'est de la France (USINOR), Paris, France

Division of Ser. No. 316,487, Oct. 29, 1981, Pat. No. 4,436,791. This application Jan. 5, 1984, Ser. No. 568,431

Claims priority, application France, Oct. 31, 1980, 80 23316

Int. Cl.[4] C21D *9/38, 1/19*

U.S. Cl. 148—3 **10 Claims**

1. A method for producing a cast bimetallic composite roll for cold rolling, comprising in combination a heart metal constituted by a nodular or lamellar cast iron and a case metal constituted by a steel, said method comprising the steps of:

(1) centrifugally casting first a layer of the case metal of steel having a chromium content of 8 to 16%, a carbon content of 0.65 to 0.95% and a chromium/carbon ratio between 11 and 16, and then casting a core of the heart metal of modular or lamellar cast iron to form the bimetallic composite roll;

(2) subjecting the thus-cast roll to an austenizing treatment at a temperature higher than 900° C. for a period of 8 to 24 hours;

(3) hardening the roll stopped at a temperature of 450° to 550° C., then maintaining the temperature at 500° to 550° C. for a period of 8 to 24 hours;

(4) cooling the roll to room temperature; and

(5) subjecting the roll to a tempering treatment so as to reactivate the austenite at a temperature between 400° and 450° C. for a period of 8 to 24 hours.

4,548,654

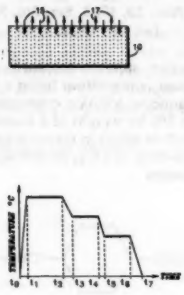
SURFACE DENUDING OF SILICON WAFER

Philip J. Tobin, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1983, Ser. No. 500,735

Int. Cl.[4] H01L *21/265, 7/54, 21/322*

U.S. Cl. 148—1.5 **14 Claims**



1. A process for preparing a silicon substrate for the fabrication of a device which comprises the steps of:

providing a silicon substrate having a concentration of oxygen incorporated therein;

heating said substrate to a first elevated temperature in a reducing ambient;

lowering the temperature of said substrate to a second elevated temperature lower than said first elevated temperature; and

maintaining said substrate at said second elevated temperature for a time to allow nucleation of oxygen precipitates in the bulk of said substrate.

4,548,655

METHOD FOR PRODUCING CUBE-ON-EDGE ORIENTED SILICON STEEL

Robert F. Miller, Evans City, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 399,674, Jul. 19, 1982, abandoned. This application Nov. 22, 1983, Ser. No. 554,410

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **5 Claims**

1. In a method for producing cube-on-edge oriented silicon steel, characterized by reduced watt loss, including the steps of hot rolling, cold rolling with intermediate annealing to final gauge, normalizing said steel to effect decarburization and primary recrystallization and a final texture annealing to effect secondary recrystallization, the improvement comprising providing a uniform light cold rolling deformation of 0.5 to 5% reduction in area of the decarburized steel prior to final texture annealing to reduce grain size.

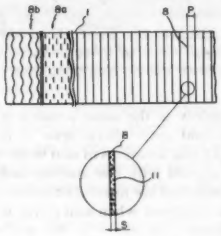
5. In a method for producing cube-on-edge oriented silicon steel, characterized by reduced watt loss, including the steps of hot rolling, cold rolling with intermediate annealing to final gauge, normalizing said steel to effect decarburization and primary recrystallization and a final texture annealing to effect secondary recrystallization, the improvement comprising providing a at least one uniform light cold rolling deformation to achieve a 0.5 to 15% elongation of the decarburized steel prior to final texture annealing to reduce grain size.

4,548,656

METHOD AND APPARATUS FOR REDUCING THE WATT LOSS OF A GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET AND A GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET HAVING A LOW WATT LOSS

Tetsuo Kimoto; Kiyoshi Orita, and Katsuro Kuroki, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,334
Claims priority, application Japan, Jul. 17, 1981, 56-110858
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 **3 Claims**



1. A method for reducing the watt loss of a grain-oriented electromagnetic steel sheet, characterized in that:

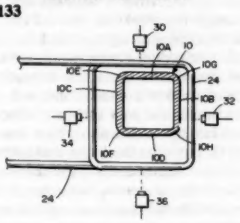
after final annealing of a steel sheet during which grain orientation occurs an insulating film is applied to the surface of said grain-oriented electromagnetic steel sheet, and thereafter, particles consisting of metal are projected onto substantially linear selected portions of the surface of said grain-oriented electromagnetic steel sheet having said applied insulating film thereon to form spot-like indentations in said steel sheet in said linear selected portions, wherein said linear selected portions are parallel to one another and are oriented transverse to the longitudinal direction of the grain-oriented electromagnetic steel sheet, with said projecting taking place at a projection speed of from 12 to 52 m/sec and at a projection amount of from 3 to 30 kg/min/m^2 thereby producing strain in the spot-like indentations of said selected portions of said grain-oriented electromagnetic steel sheet, said spot-like indentations having a diameter of from approximately 60 to 80 microns and a depth of from approximately 3 to 5 microns, and said selected portions are spaced from one another at a distance of from 3 to 10 mm.

4,548,657

BOW CONTROL FOR METALLIC STRUCTURES

Fletcher C. Eddens, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Jun. 14, 1982, Ser. No. 387,829
Int. Cl.[4] C22F *1/18*
U.S. Cl. 148—133 **9 Claims**



1. A method of controlling the bowing action of at least one elongate zirconium structure including opposite ends, adapted for vertical positioning, said bowing action occurring upon the expansion due to external factors upon said mounted structure;

said method comprising the steps of:

heat treating said structure prior to mounting, said heat treatment including heating a full length portion of said structure to a temperature in the beta range and the remainder of said structure at a temperature below the beta range, said heat-treated full-length structure portion being adapted to expand at a different rate than the remainder of said structure such that bowing due to said external factors occurs substantially only in a predicted direction; and

securing said heat-treated structure at its opposite ends in a manner whereby bowing in said predicted direction is capable of taking place without interference with other nearby structures.

9. A method of controlling the bowing action of a plurality of hollow, axially elongate channels of an alloy of zirconium each adapted to be rigidly mounted at their opposite ends as part of a four-channel module, each of said channels having four walls and a generally square cross section, a full-length control rod having a substantially cruciform cross section separating respective channels from each other in said module and positioned in spaced relationship to said channels;

said method comprising the steps of:

positioning each of said channels within an induction heating coil with the centers of said channel and said coil displaced from each other such that one pair of adjacent channel walls is more closely coupled to said coil than the opposite pair of adjacent walls;

passing said positioned channel through said coil in an axial direction;

heating said one pair of adjacent walls to the beta range while simultaneously heating said opposite pair of adjacent walls to the alpha-plus-beta range; and

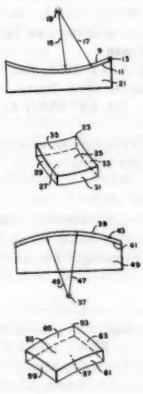
mounting each of said channels in its module with said one pair of walls positioned closer to said control rod than said opposite wall pair.

4,548,658

GROWTH OF LATTICE-GRADED EPILAYERS

Melvin S. Cook, 43 Westerly Rd., Saddle River, N.J. 07458

Filed Jan. 30, 1985, Ser. No. 696,438
Int. Cl.[4] H01L *21/20, 29/26*
U.S. Cl. 148—175 **12 Claims**



1. A method of growing an epitaxial layer composed of semiconductor material belonging to the cubic crystal system on a substrate with the lattice constant of said epitaxial layer changing from an initial lattice constant adjacent to said substrate to a final lattice constant on the surface of said epitaxial

layer when the growth is completed, comprising the steps of forming a plurality of growth surfaces on said substrate; growing an epitaxial layer on said growth surfaces and controlling the lattice constant of said epitaxial layer to change from said initial lattice constant to said final lattice constant; said growth surfaces and the controlled changes in lattice constant being such that for each first element of area on the surface of said epitaxial layer having a first lattice constant at a first point in time during growth of said epitaxial layer there is a correlated second element of area on the surface of said epitaxial layer having a second lattice constant at a second point in time during growth of said epitaxial layer, said second point in time occurring after said first point in time, with the ratio of each first element of area to its correlated second element of area being less than unity if said first lattice constant is lesser than said second lattice constant, and being greater than unity if said first lattice constant is greater than said second lattice constant; and controlling the correlation between each first element of area and its correlated second element of area such that as growth of said epitaxial layer proceeds, the portion of said epitaxial layer growing from said first element of area has a surface which coincides with said correlated second element of area at said second point in time.

4,548,659

CAST EMULSION EXPLOSIVE COMPOSITION

Harvey A. Jessop, Lehi, Utah, assignor to IRECO Incorporated, Salt Lake City, Utah

Filed Apr. 5, 1984, Ser. No. 597,416
Int. Cl.[4] C06B *45/06*
U.S. Cl. 149—18 **10 Claims**

1. A cast explosive composition, which comprises a water-in-oil emulsion when formulated at an elevated temperature but which becomes cast upon cooling due to a weakening or breakdown of the emulsion, further comprising inorganic oxidizer salt primarily consisting of ammonium nitrate; a water-immiscible organic liquid fuel; less than about 5% water by weight of the total composition; and an emulsifier which allows the formation of a water-in-oil emulsion at an elevated formulation temperature but which allows the emulsion to become unstable and the inorganic oxidizer salt to crystallize at ambient temperature to produce a cast composition.

4,548,660

WATER-IN-OIL EMULSION EXPLOSIVE

Yoshiyuki Ikeda; Atsuo Inoue, and Kenjiro Ikeda, all of Yamaguchi, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,957
Claims priority, application Japan, Feb. 24, 1983, 58-28521
Int. Cl.[4] C06B *45/02*
U.S. Cl. 149—21 **7 Claims**

1. A water-in-oil type emulsion explosive containing
an aqueous oxidizer solution,
an oily material,
an emulsifier, and
hollow microspheres; wherein said oily material which forms a continuous phase of said emulsion comprises a mixture of an oil component and petroleum resin.

4,548,661

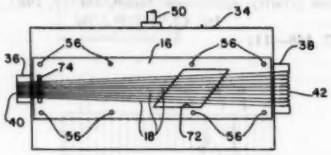
METHOD FOR ASSEMBLING A MULTICONDUCTOR FLAT CABLE

Edward A. Escallier, Norwalk; Stanley R. Dawson, Corona, and Joseph M. Shaheen, La Habra, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,640
Int. Cl.[4] H01B *13/08*
U.S. Cl. 156—52 **8 Claims**

1. A method for assembling a multiconductor flat cable, comprising the steps of:

(a) mounting combs at opposite ends of a mandrel plate;
(b) applying an insulation base sheet to one face of said plate;
(c) winding a conductor around said plate and combs and over said base sheet;
(d) applying an insulation cover sheet to said base sheet with multiple runs of said conductor extending therebetween so as to assemble a multiconductor flat cable on said face of said plate in condition wuitable for laminating said base and cover sheets together; and



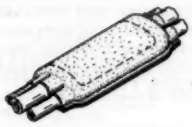
(e) cutting a window at the same location in each of said insulation base and cover sheets prior to performance of steps (b) and (d), said locations of said windows being such that they are aligned with one another and said multiple runs of said conductor are located between opposite edges of said aligned windows when said cover sheet is applied to said base sheet.

4,548,662

METHOD OF PROVIDING A PROTECTIVE COVERING OVER A SUBSTRATE

David Chazan, Palo Alto, and Michael J. Katila, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 493,445, May 11, 1983, Pat. No. 4,517,449.
This application Jan. 23, 1985, Ser. No. 693,707
Int. Cl.[4] B29C *27/00*; B32B *31/00*
U.S. Cl. 156—86 **15 Claims**



1. A method of providing a protective covering over a substrate, which method comprises:

(A) placing adjacent the substrate a heat-shrinkable article comprising a laminar electrical heater which comprises
(1) a first laminar electrode which has low electrical resistance through the thickness thereof but has substantial electrical resistance along the thickness thereof;
(2) a first electrical connection means which
(a) makes distributed electrical contact with the first electrode in a first contact zone, and
(b) can be connected to a source of electrical power;
(3) a second laminar electrode which has low electrical resistance through the thickness thereof but has substantial electrical resistance along the thickness thereof;
(4) a second electrical connection means which
(a) makes distributed electrical contact with the second electrode in a second contact zone which is offset from the first contact zone, and
(b) can be connected to a source of electrical power; and
(5) a laminar resistive element which has substantial elec-

trical resistance through the thickness thereof and which is sandwiched between the first and second electrodes;

said heater comprising

a heating area which lies between the first contact zone and the second contact zone, and in which, when the first and second connection means are connected to a source of electrical power, current flows through the thickness of the resistive element between the electrodes, and

(b) a connection area which lies between the first contact zone and the second contact zone, in which the resistive element and the second electrode are present, and in which, if both electrodes are present, at least one of the electrodes is electrically insulated from the resistive element so that, when the first and second connection means are connected to a source of electrical power, heat is not generated in the resistive element in the connection area;

and the second electrical connection means being so connected to the second electrode that there are points on the second electrode which are in the heating area and which are connected to the second connection means by a path of least electrical resistance which passes through the connection area, and

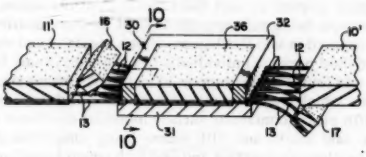
(B) connecting the first and second electrical connection means to a source of electrical power to cause heating of selected areas of the article, at least some of the selected areas shrinking towards the substrate.

4,548,663

CONVEYOR BELT SPLICING

Winthrop S. Worcester, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 8, 1984, Ser. No. 587,472
Int. Cl.⁴ B31F *5/00*
U.S. Cl. 156—159 **8 Claims**



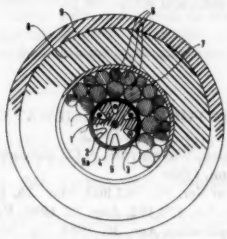
1. The method of joining the end sections of conveyor belts formed of urethane filler material and having an end face at each section with a plurality of strands embedded therein and extending in a lengthwise directions of the belt comprising the steps of removing filler material out of one end section of one of said belts to be spliced to form a first end portion retaining one of said end faces thereon connected via strands to the main body portion of said one end section having a newly formed outer end face thereon; removing filler material out of the other one of said end sections of said belts to form a second end portion retaining the other one of said end faces thereon and connected via bare strands to the main body portion of the other end sections having a newly formed outer end face; overlapping said end sections to align said strands and with said first end portion adjacent said newly formed outer end face of said second end portion and with said second end portion adjacent said newly formed outer end face of said one end section; pouring a urethane molded belt section between said newly formed outer end faces that is spaced therefrom but encapsulates a portion of said laterally spaced strands to define a center belt section; cutting off both of said end portions; aligning the remaining bare strands into parallel relationship; and pouring urethane molded belt sections between said center belt section and said newly formed outer end faces to form a continuous belt splice between said end sections of said belts.

4,548,664

METHOD OF INJECTING A VISCOUS FILLER MATERIAL INTO FIBER-RECEIVING GROOVES IN THE CORE OF AN OPTICAL FIBER CABLE

Jean-Luc Canivet, Oye Plage, France, assignor to Les Cables de Lyon, France

Filed Jul. 19, 1984, Ser. No. 632,173
Claims priority, application France, Jul. 27, 1983, 83 12409
Int. Cl.⁴ B65H *81/02;* **G02B** *5/14*
U.S. Cl. 156—166 **3 Claims**



1. A method of injecting a viscous filler material into fiber-receiving grooves in the core of an optical fiber cable, the method comprising the steps of:

winding a first tape spirally around the fiber-containing core and leaving gaps between adjacent turns of the said first tape;

passing the taped core through a calibrated bore of slightly greater diameter;

injecting viscous filler material into the said bore at a pressure chosen in relation to the speed of progress of the core through the bore to ensure that filler material passes through the gaps between the adjacent turns of the tape to completely fill the volume of the grooves that is unoccupied by the fibers, but without the filler material being able to extend back along the grooves upstream from the point of injection; and

winding a second tape spirally around the core containing both the fibers and the filler material in its grooves, said second tape being wound so as to close the gaps between the turns of the first tape.

4,548,665

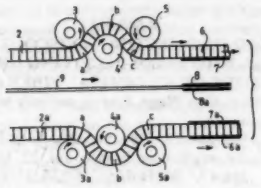
METHOD FOR MANUFACTURING AN ELEMENT HAVING A CURVED SURFACE FROM A RIGID PANEL OF A MATERIAL OF THE "HONEYCOMB" TYPE AND THE PRODUCT OBTAINED

Claude P. Morin, Peymeinade, France, assignor to Immolding Establishment, Vaduz, Liechtenstein

Filed Mar. 9, 1984, Ser. No. 587,895
Claims priority, application France, Mar. 15, 1983, 83 04226
Int. Cl.⁴ B31D *3/02*
U.S. Cl. 156—197 **6 Claims**

1. A method for manufacturing an element having a curved surface substantially in the shape of a portion of a sphere, from a rigid panel having a honeycomb structure, which panel comprises thin parallel bands spot-welded together by staggered spot-welds and stretched by spreading the bands apart so as to form regular cavities, said method comprising breaking the rigidity of a planar panel having said structure by passing the panel between a plurality of cylinders having a hard surface and axes of rotation which are parallel but offset so as to impart to the panel as many changes in direction as there are cylinders at substantially a right angle so as to fold or corrugate the walls of the cavities roughly in a direction parallel to

edges of apices formed by sides of the apices, heating the panel rendered supple in this way and placing it on a form which is



at least partly spherical where the panel cools and assumes the desired shape.

4,548,666

METHOD FOR FORMING A RAILWAY CENTER PLATE LINER

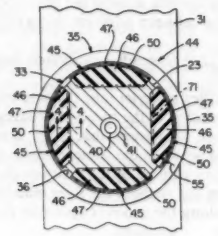
Julien C. Mathieu, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 362,803, Mar. 26, 1982, abandoned, Division of Ser. No. 179,192, Aug. 18, 1980, Pat. No. 4,341,162. This application Apr. 30, 1984, Ser. No. 604,411

The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—245 **2 Claims**



1. In a method of making a bolster arrangement for a railway vehicle comprising the steps of, providing a center plate that is secured to the body bolster of the car body of said vehicle, providing a bolster bowl for the truck body of said vehicle so that said bolster bowl has an upstanding annular flange, disposing said center plate in said bolster bowl so that said center plate is received within said flange, forming polymeric material to define liner means and disposing said liner means so as to be between said center plate and said annular flange when said center plate is received in said annular flange, the improvement in said method wherein said forming step comprises forming said liner means in the form of a plurality of pads as a deformable polymeric laminate comprised of a first deformable polymeric material comprising rubber which is adapted to reduce load concentration against said flange and a second deformable ultra high molecular weight polymeric material which provides an antifriction surface between said body center plate and flange, said forming step causing said first material to be an inner part of said liner means and said second material to be an outer part of said liner means, said forming step acting to simultaneously form and cure said first material against an inside surface of said second material and form a tenacious bond between said first material and said second material, said laminate resulting in an increased operating life for said peripheral flange because said laminate is adapted to deform into the contour of said flange.

4,548,667

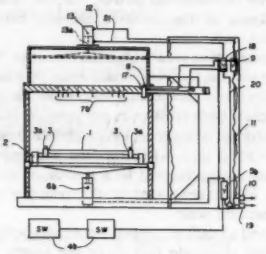
PLANNED COORDINATE COMPONENT PLACEMENT SYSTEM

Robert M. Wical, 705 S. East St., Culpeper, Va. 22701

Filed Mar. 28, 1984, Ser. No. 594,327

Int. Cl.[4] B65G *59/04*

U.S. Cl. 156—356 **35 Claims**



1. A planned coordinate component placement system comprising a first means having embodied therein Cartesian means for identifying specific component location points unique to said system and means for facilitating transferral of all said component location points to a recipient material; a second means having disposed therein second means controls means which means control externally supplied fluid pressure and externally supplied electric power, said fluid pressure and external electrical power means, when applied through said second means controls means, actuate and pressurize a multiple point adhesive dispensing means and a recipient material vertical positioning means, both of which are disposed in said second means; a robotic recipient material transferring means, a third means having disposed therein third means controls means for controlling externally supplied fluid pressure and externally supplied electrical power through activation of the appropriate portion of said third means controls means, said fluid pressure being released into a fluid pressure distributive means disposed in said third means which regulates and distributes said fluid pressure individually to a plurality of said fourth means; said fourth means supported in a fourth means supportive means which is suitably means disposed in said third means; and a fifth means containing surface mounted electronic components, said fourth and fifth means being dimensioned and shaped to telescope together and said fifth means having means to be secured to said fourth means; said surface mount components sealing means caused to be acted upon by said distributed fluid pressure and which are applied directly to a recipient material.

4,548,668

COMBINATION MACHINE FOR ASSEMBLING CONTAINER COMPONENTS

Donald J. Roth, Westport; Charles S. Kubis, Weston, both of Conn., and John Walter, Evergreen Park, Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

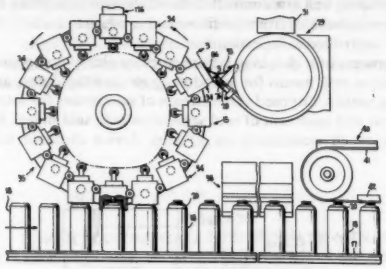
Filed Jan. 10, 1983, Ser. No. 456,959

Int. Cl.[4] B32B *31/00*; B65C *9/40*; B29D *3/00*; B31F *5/00*

U.S. Cl. 156—357 **15 Claims**

1. An apparatus for assembling end units to tubular bodies wherein each end unit has a cylindrical terminal portion for telescoping over an open end of an associated body, said apparatus comprising a first conveyor for conveying tubular bodies along a first preselected path, a second conveyor for conveying end units along a second preselected path from an end unit receiving position to a position overlying said first preselected path, said second conveyor having individual carriers for individual end units, means for supplying an end unit to each of said carriers in sequence, applicator means along said second path for applying a band of adhesive internally of the cylindri-

cal terminal portion of each end unit in sequence, and means for placing each end unit having said band of adhesive thereon on a body in telescoped relation, said applicator means being mounted for parallel swinging movement adjacent a portion of



said second path in timed relation to movement of a respective one of said carriers along said second path portion, and means cooperating with said carriers along said second path portion to maintain said carriers in a fixed attitude facing said applicator means.

4,548,669

LIGHT WAVEGUIDE WELDING DEVICE

Peter Steinmann, Deisenhofen; Reinhard Engel, Munich; Richard Parstorfer, Geltendorf; Rudolf Brugger, Puchheim, and Gerhard Jonke, Gilching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

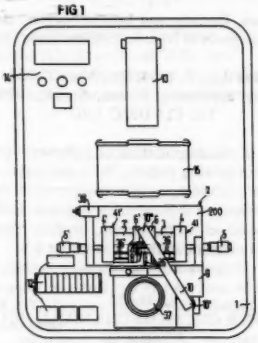
Filed Dec. 7, 1983, Ser. No. 558,878

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245229

Int. Cl.[4] C03B *23/20;* **C29B** *27/06*

U.S. Cl. 156—358 **23 Claims**

FIG 1



1. A device for splicing a pair of ends of a pair of light waveguides comprising a housing containing a clamping device, melting means for fusing the ends of the waveguides to form a splice joint therebetween and means for applyinq a splice protector to the splice joint of the pair of waveguides, said clamping device having a base supporting a support member with a V-shaped centering groove for receiving the waveguide ends free of sheaths, a pair of clamping means movable on the base along a first direction relative to said support member, each of said clamping means including a holding groove extending along said direction with first clamping element for holding a waveguide with an external sheath in a portion of the holding groove spaced from the support member and a second clamping element for holding a waveguide free of the external sheath in a second portion adjacent the support member, said second portion of the groove having a sloping bottom descending downward toward the centering groove, said second element including a jaw having a sloping surface matching the sloping bottom for urging the waveguide downward along the bottom of the holding groove so that the end of the waveguide free of all sheaths extends into the centering groove, said clamping device having advance means for automatically moving one of the clamping means along said direction toward the other clamping means to urge the ends together during fusion thereof and restoring means for moving one of the clamping means away from the other to stretch the fused waveguide ends into a straight line configuration; said melting means including a pair of electrodes arranged adjacent the support member to heat the ends, current supply means to supply alternating current to the electrodes to create an alternating current discharge path at the ends of the waveguides and electronic sequence control means for controlling the advance means and the melting means to operate in the desired sequence.

4,548,670

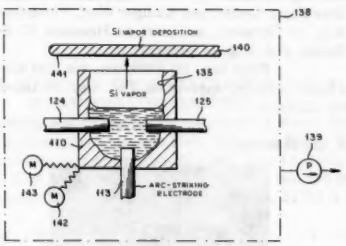
SILICON MELTING AND EVAPORATION METHOD FOR HIGH PURITY APPLICATIONS

Eduard Pinkhasov, Mt. Vernon, N.Y., assignor to Wedtech Corp., Bronx, N.Y.

Filed Jul. 20, 1984, Ser. No. 633,124

Int. Cl.[4] C22B *4/00*

U.S. Cl. 156—617 SP **12 Claims**



1. A method of melting silicon which comprises the steps of:

(a) forming at least one bore in a solid silicon body and juxtaposing a pair of electrodes including at least one electrode extending into said bore, within the interior of said body; and

(b) passing an electric current through said electrodes for generating an electric arc between phase ends of said electrodes in the interior of said body to melt silicon from said body and form a cavity therein containing molten silicon.

4,548,671

METHOD OF MAKING A CHARGE-COUPLED DEVICE IMAGER WHICH INCLUDES AN ARRAY OF SCHOTTKY-BARRIER DETECTORS

Walter F. Kosonocky, Montgomery Township, Somerset County, and Frank V. L. Shallcross, West Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 23, 1984, Ser. No. 633,437

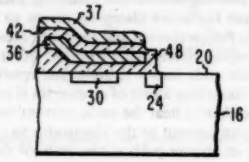
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **26 Claims**

1. In a method of making an imager which includes a substrate of single crystalline silicon of one conductivity type having along one surface thereof a charge-coupled device formed of a channel region within said substrate and extending along said substrate surface and a plurality of conductive gates along said channel and extending transversely across the channel, the steps of

forming in said substrate at said one surface a narrow guard-ring region which extends along and has one edge in substantial alignment with the ends of at least some of the gates and a second edge spaced from the ends of the gates,

forming a layer of insulating material over said guard-ring region with an edge of the insulating material being in



substantial alignment with the second edge of the guard-ring region, and

forming on said surface of a substrate a conductive layer which forms a Schottky-barrier junction with the substrate with the conductive layer having an edge in substantial alignment with the second edge of the guard-ring region.

4,548,672

PROCESS FOR TREATING THE SURFACE OF VALVE METALS WITH CHALCOGENS

Wolf-Wigand Albrecht; Axel Hoppe, both of Bad Harzburg; Uwe Papp, Goslar, and Rüdiger Wolf, Vienenburg, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,635

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336453

Int. Cl.⁴ B22F *1/04*

U.S. Cl. 156—646 **9 Claims**

1. A process for treating the surface of valve metals in the form of agglomerated or non-agglomerated powders, thin foils or molded articles prepared from powder for use as electrodes for electrolytic capacitors, which process comprises heating these metals in at least one stage to temperatures of from 300° to 2,000° C. under a high vacuum or in an inert gas atmosphere in the presence of chalcogens or chalcogen compounds, excluding oxygen.

4,548,673

METHOD AND APPARATUS FOR DEINKING

Ashok K. Nanda, Sale, England; Luigi Silveri, and Michael A. McCool, both of Lenox, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 16, 1984, Ser. No. 600,923

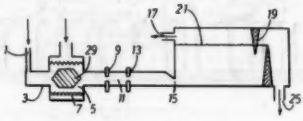
Claims priority, application United Kingdom, Apr. 19, 1983, 8310494

Int. Cl.⁴ D21B *1/32*

U.S. Cl. 162—4 **15 Claims**

1. A method of deinking a fibre stock or slurry comprising the steps of independently controlling the flow of slurry and air to a mixing zone; introducing the air into the slurry while controlling the quantity and size of air bubbles introduced; passing the slurry with air bubbles introduced therein to a mixing zone; mixing the air and the slurry with said mixing being controlled independently and apart from said step of introducing the air to bring the air bubbles into contact with the ink; passing the mixed air and slurry from the mixing zone to a separation cell at a controlled flow rate, and separating the ink-laden air bubbles from the fibre slurry, wherein each of the steps is controlled independently.

8. Apparatus for deinking a fibre stock or slurry comprising a separation cell, means for introducing air into the slurry, and a mixing section disposed downstream of said means for introducing air and upstream of said separation cell; said means for introducing air comprising an air inlet device disposed in a



slurry inlet upstream of said mixing section, said mixing section comprising at least one turbulent flow generating means for creating a mixture to be fed to the separation cell where an ink-laden foam is formed on the surface of the slurry as a result of separation; and said separation cell being a tank having an inlet toward the bottom for feeding the mixture from said mixing section to the cell, one of a standpipe and weir of adjustable height for determining the surface level of the slurry in the tank, means for removing the ink-laden foam from the surface of the slurry, an outlet draw off for the clean slurry and a separation plate extending into the slurry and partially dividing the tank to isolate said means for removing foam from said clean slurry outlet.

4,548,674

PROCESS FOR THE REGENERATION OF WASTE PAPER

Jacques Hageman, Corbais, and Liliane Meyers, Brussels, both of Belgium, assignors to Interox (Société Anonyme), Brussels, Belgium

Filed Aug. 2, 1984, Ser. No. 637,034

Claims priority, application France, Aug. 8, 1983, 83 13136

Int. Cl.⁴ D21C *5/02*

U.S. Cl. 162—5 **11 Claims**

1. A process of the degradation of polymeric contaminants in waste paper comprising pulping the waste paper in an acidic aqueous solution containing at least one peroxide compound in an amount sufficient to substantially degrade said polymeric contaminants selected from among organic and inorganic peracids at a pH of from about 2.5 to about 6.5.

4,548,675

NONSULFUR CHEMIMECHANICAL PULPING PROCESS

John Gordy, Richmond, Canada, assignor to New Fibers International, Nassau, The Bahamas

Continuation-in-part of Ser. No. 494,703, May 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 303,944, Sep. 21, 1981, Pat. No. 4,397,712, which is a continuation-in-part of Ser. No. 237,723, Feb. 24, 1981, abandoned, which is a continuation of Ser. No. 83,784, Oct. 11, 1979, Pat. No. 4,259,147, which is a continuation of Ser. No. 842,262, Oct. 4, 1977, abandoned, which is a continuation of Ser. No. 551,259, Feb. 20, 1975, abandoned. This application Nov. 25, 1983, Ser. No. 554,909

Int. Cl.⁴ D21C *3/02, 3/20*

U.S. Cl. 162—26 **17 Claims**

1. A process for pulping woody materials comprising:

providing a pulping solution containing a dilute mixture of a lower alkanolamine and ammonium hydroxide in water;

providing a heated vessel;
admitting a predetermined quantity of chips and solution to said vessel;
impregnating said chips in said solution and digesting said chips under conditions of temperature and pressure effective to initiate a lignin depolymerization reaction in said chips for a predetermined period of time;
refining said chips to produce said pulp and separating the used solution from the pulp.

4,548,676

PAPER HAVING CALCIUM SULFATE MINERAL FILLER FOR USE IN THE PRODUCTION OF GYPSUM WALLBOARD

Norman E. Johnstone, and John R. Kehoe, both of Schaumburg, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 462,629, Jan. 31, 1983, Pat. No. 4,470,877, which is a continuation-in-part of Ser. No. 441,711, Nov. 15, 1982, which is a continuation-in-part of Ser. No. 263,371, May 13, 1981, Pat. No. 4,372,814. This application Jun. 18, 1984, Ser. No. 621,956

Int. Cl.[4] D21H *3/02*

U.S. Cl. 162—135 **13 Claims**

1. A paper suitable for use as cover sheets in the production of gypsum wallboard, said paper comprising:
(A) cellulose fibers in an amount of at least about 60% by dry weight,
(B) calcium sulfate as a filler in an amount of from about 10% to about 35% in dry weight,
(C) a binder in an amount from about 1% to about 3½%,
(D) a flocculant in an amount of from about 0.1% to about 0.2%,
(E) a neutral sizing agent in an effective amount to prevent water penetration,
(F) calcium carbonate as a buffering agent in an amount from about 0.25% to about 10%, and
(G) an anionic polyacrylamide as a retention aid in an amount suitable for retaining said filler in said paper.

4,548,677

CIGARETTE PAPER

Werner Schneider, Quickborn; Dirk Pangritz, Wedel, and Walter Riedesser, Neustadt, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 547,196

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240253

Int. Cl.[4] D21F *11/00*

U.S. Cl. 162—139 **4 Claims**

1. A cigarette paper comprising:
(a) burning additives and fillers,
(b) from 20 to 50% by weight of a fiber selected from the group consisting of flax fibers, hemp fibers, or a combination of flax and hemp fibers, based on the dry weight of the paper, said fibers having an extremely fine fibrillation and a grinding degree of at least 92 SR, and characterized in that the fiber length ratio of said fibers when tested by determining the fiber fraction R_{16} is such that 35 to 45% of the tested fibers remain as a residue when sifted with a sieve having 16 meshes per 1 cm.

4,548,678

FLEXIBLE SHEET MATERIAL AND ARTICLES MADE THEREFROM

Philip Laflin, Bacup; Ian Eddleston, Milnrow, and Mathew A. Hepworth, Cheadle Hulme, all of England, assignors to T&N Materials Research Limited, Manchester, England

Filed May 12, 1983, Ser. No. 494,016

Claims priority, application United Kingdom, Jun. 10, 1982, 8216931

Int. Cl.[4] D21F *11/00*

U.S. Cl. 162—146 **5 Claims**

1. A wear resistant lubricated bearing or rotar blade for a lubricated vane pump, said bearing or rotor blade having high compressive strength and molded from a non-asbestos flexible sheet material comprising particles of graphite admixed with heat-resistant web-forming fibres of a poly(aromatic amide), said particles and said fibres being bound together with an organic binder; said flexible sheet material being made by a process in which an aqueous slurry of the aforesaid ingredients is progressively dewatered as a layer on a water-permeable conveyor and the dewatered layer is subsequently compressed and dried, said flexible sheet material having said ingredients in the following proportions by dry weight:

graphite	20–40%
heat-resistant web-forming fibers of poly(aromatic amide)	45–78%
organic binder comprising cellulose pulp	2–15%

4,548,679

HANGING MERCURY DROP ELECTRODE CAPABLE OF AUTOMATIC CONTROL

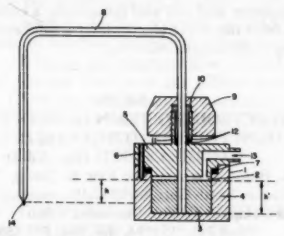
Rolando Guidelli, and Maria L. Foresti, both of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation-in-part of Ser. No. 458,342, Jan. 17, 1983, abandoned. This application Nov. 29, 1983, Ser. No. 556,065

Claims priority, application Italy, Aug. 9, 1982, 22785 A/82

Int. Cl.[4] G01N *27/34*

U.S. Cl. 204—1 T **14 Claims**



7. A method of rapidly generating static mercury drops of reproducible size and of holding them for an indefinitely long time at one end of a capillary tube immersed in a solution subject to the atmospheric pressure, the other end of said capillary tube being connected to a mercury reservoir, which method comprises:
(a) setting the level of said capillary end holding said mercury drop lower than the upper level of the mercury pool in said reservoir by about 1 to 2 cm, so as to roughly counterbalance the back-pressure;
(b) choosing said capillary tube of a sufficient length and of a sufficiently small inner diameter such that, in conjunction with said difference in level, viscous forces prevent mercury from flowing through said capillary tube when said mercury reservoir is subject to the atmospheric pressure;

(c) causing the mercury to flow through said capillary tube and hence said mercury drop to grow by application of a pressure higher than the atmospheric pressure to said mercury reservoir;

(d) limiting the surface area of said mercury drop after attainment of the desired size by rapidly switching the pressure on said mercury reservoir to the atmospheric value.

4,548,680

METHOD FOR DETERMINING THE PARTIAL PRESSURE OF OXYGEN IN AN ATMOSPHERE

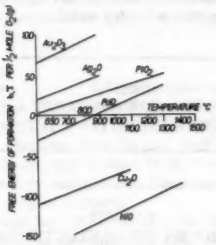
Henderikus J. de Bruin, Bellevue Heights, and Sukhvinder P. S. Badwal, Ingle Farm, both of Australia, assignors to The Flinders University of South Australia, Australia

Division of Ser. No. 42,229, May 24, 1979, Pat. No. 4,384,934. This application Feb. 23, 1982, Ser. No. 351,488

Claims priority, application Australia, May 31, 1978, PD4563; Nov. 17, 1978, PD6823

Int. Cl.⁴ G01N *27/56*

U.S. Cl. 204—1 T **6 Claims**



1. A method of determining the partial pressure of oxygen in an atmosphere, in which a temperature of T_c at which the free energy of formation of an oxide of a metal in contact with the atmosphere becomes zero is determined to provide a measure of the partial pressure of oxygen in the said atmosphere.

2. A method according to claim 1, wherein the said metal exhibits both positive and negative free energy of formation of an oxide thereof and is the active electrode of a cell located in said atmosphere, said cell also comprising a counter electrode separated from the active electrode by a solid electrolyte material having ionic oxygen mobility.

4,548,681

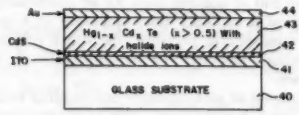
ELECTRODEPOSITION OF THIN FILM HETEROJUNCTION PHOTOVOLTAIC DEVICES THAT UTILIZE Cd RICH $Hg_{1-x}Cd_xTe$

Bulent M. Basol, Los Angeles; Eric S. Tseng, Torrance, and Dennis S. Lo, South Gate, all of Calif., assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Feb. 3, 1984, Ser. No. 576,559

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 204—2.1 **3 Claims**



1. A method of electrodepositing a film of $Hg_{1-x}Cd_xTe$ on a conductive substrate with controlled Hg stoichiometry using a deposition bath with a reference electrode, said conductive substrate as a cathode, and at least one anode, said at least one anode comprising tellurium, the method comprising the steps of

providing an electroiyte containing 0.1 molar to 1.5 molar Cd^{2+} ions, 10^{-5} molar to 10^{-3} molar $HTeO_2^+$ ions, and Hg^{2+} ions in a concentration selected between about 1 to 20 ppm; halide ions and an acid to adjust the pH of said electrolyte to between 1 and 3, the molar ratio of halide ions to anions derived from the acid ranging from 0.01 to 0.06; and

adjusting the applied potential between said reference electrode and cathode and the Hg^{2+} ion concentration in the solution so that a $Hg_{1-x}Cd_xTe$ compound with controlled stoichiometry is formed on said cathode surface.

4,548,682

PROCESS OF PRODUCING MAGNETIC RECORDING MEDIA

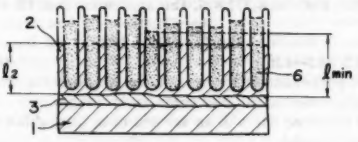
Koichi Yoshida; Yoshio Hirayama; Yasuo Oka, and Takashi Kajiyama, all of Shizuoka, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,512

Claims priority, application Japan, Jun. 10, 1983, 58-103978; Oct. 7, 1983, 58-187766

Int. Cl.⁴ C25D *11/20*

U.S. Cl. 204—35.1 **13 Claims**



1. A process for producing a magnetic recording medium by packing a magnetic substance in micro pores of an anodic oxide film formed on an aluminum substrate by an anodic oxidation treatment, comprising the steps of subjecting said substrate to an anodic oxidation treatment in an electrolytic bath to form an anodic oxide film having a thickness of at least 4 μm, immersing the anodized aluminum substrate in an acid bath or an alkali bath to enlarge the micro pores in said anodic oxide film to a pore diameter in the range of 300 Å to 1,400 Å by chemically dissolving the walls of said pores, then subjecting said substrate to an electrolytic treatment in a bath containing ions of a magnetic substance to deposit the metallic magnetic substance in the enlarged micro pores, and physically grinding the surface of the anodic oxide film to expose the packed magnetic substance on the surface of said film.

4,548,683

METHOD OF ELECTROLYTICALLY GRAINING A LITHOGRAPHIC PLATE

Jen-chi Huang, Ossining; Gregory Von Gruenberg, Mohegan Lake, both of N.Y., and Donald J. Riley, Tenafly, N.J., assignors to Polychrome Corp., Yonkers, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,659

Int. Cl.⁴ C25F *3/04*

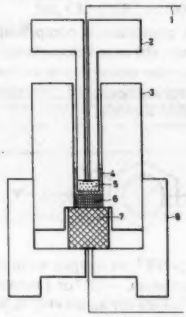
U.S. Cl. 204—129.4 **7 Claims**

1. In a method of electrolytically graining a surface of a lithographic plate comprising immersing said lithographic plate in an acidic bath; and subjecting said lithographic plate to an alternating current for a time period sufficient to attain said graining; the improvement which comprises utilizing an alternating current having a current density within the range of about 7 to 22 A/dm^2, and a frequency of 140 to 400 Hz to obtain a lithographic plate surface characterized by a substantially non-directional honeycomb typography together with a substantial reduction in smut formation.

4,548,684
TREATMENT OF MANGANESE NODULES

Kazuhide Miyazaki; Yasuo Kitamura, and Toshiteru Okada, all of Takehara, Japan, assignors to Mitsui Mining & Smelting Co. Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,388
Int. Cl.[4] C25C *1/08*
U.S. Cl. 204—130 5 Claims

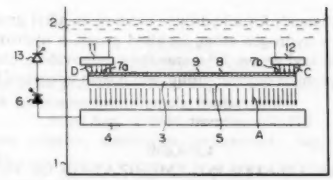


1. A process for treating manganese nodules which comprises forming an alkaline-manganese electric cell using the manganese nodules as a cathode active material component and an amalgamated Zn powder as an anode active material component and discharging said cell with a selected discharge load to thereby alter the solvent solubility of valuable metals in the manganese nodules.

4,548,685
PROCESS FOR ELECTROLYTICALLY REMOVING METAL DEPOSIT FROM A NON-PLATED SURFACE OF A SINGLE SURFACE-PLATED METAL STRIP

Yukimasa Suemitsu; Kazutsugu Nakajima; Ryoichi Naka, and Hiroo Goshi, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,451
Claims priority, application Japan, Sep. 2, 1983, 58-160397
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—146 4 Claims



1. A process for electrolytically removing metal deposit from a non-plated surface of a single surface-plated metal strip, comprising;

bringing, within an electrolytic liquid, a single surface-plated metal strip which serves as an anode plate, into a location at which the non-plated surface of said anode single surface-plated metal strip faces in parallel to and is spaced from a cathode plate, and

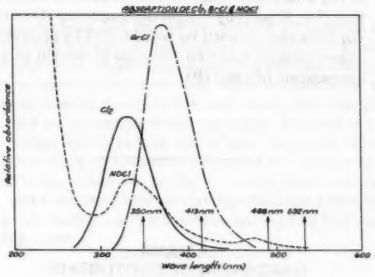
applying a principal voltage between said anode metal strip and said cathode plate and electrolytically removing metal deposit from said non-plated surface;

which process is characterized in that said electrolytic liquid consists of an aqueous solution containing $NaH_2PO_4 \cdot 2H_2O$ and a pair of supplementary anode plates are arranged, within said electrolytic liquid, in locations such that said supplementary anode plates face in parallel to and are spaced from side edge portions of the plated surface of said anode metal strip, and, while the principal voltage is applied between said anode metal strip and said cathode plate, a supplementary voltage is applied between said supplementary anode plates and said metal strip, the electric potential of said supplementary anode plates being higher than that of said metal strip, thereby preventing undersirable stripping of portions of the plated metal layer in said side edge portions of said plated surface.

4,548,686
SELECTIVE PHOTOCHLORINATION OF 1,1-DICHLOROETHANE

James C. Stevens, and Donald J. Perettie, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 499,088, May 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 386,148, Jun. 7, 1982, abandoned. This application Jan. 18, 1984, Ser. No. 571,969
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—158 HA 14 Claims



1. A selective process for preparing 1,1,1-trichloroethane comprising irradiating a vaporous mixture comprising 1,1-dichloroethane, chlorine and an effective amount of a photocatalyst wherein the photocatalyst is bromine or a compound which liberates bromine in the presence of chlorine, with radiation capable of inducing the selective formation of 1,1,1-trichloroethane wherein the photocatalyst concentration is between about 500 and 5000 parts per million based on the weight of the 1,1-dichloroethane under conditions such that the ratio of 1,1,1-trichloroethane prepared to 1,1,2-trichloroethane prepared is about 7.1 or greater.

4,548,687
SEALANT COMPOSITIONS AND METHOD OF PRODUCING THE SAME

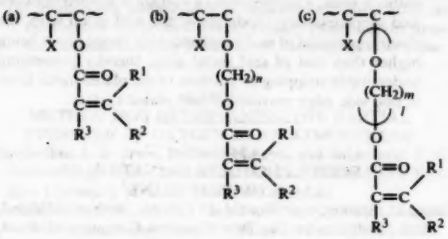
Takashi Kitamura, Higashimurayama; Yukio Fukuura, Kawagoe; Itsuo Tanuma, Sayama; Toshikazu Shinogaya, Kodaira, and Yuji Noda, Kokubunji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 490,085
Claims priority, application Japan, May 7, 1982, 57-75497
Int. Cl.[4] B32B *27/16;* C08J *3/28*
U.S. Cl. 204—159.17 3 Claims

1. A method of producing a crosslinking-reaction type sealant composition for a puncture-sealing tire, which comprises

reacting 10–35 parts by weight of component (A) at least one rubber selected from the group consisting of ethylene-propylene-diene terpolymer rubber, butyl rubber, halogenated butyl rubber and conjugated diene butyl rubber with not more than 10 parts by weight of component (C) an acryloyl or methacryloyl group containing polymerizable unsaturated compound in the presence of an alkylhypohalite to produce a polymer having an α,β-

unsaturated carboxylate group represented by any one of the following general formulae:



wherein X is a halogen atom, each of R^1, R^2 and R^3 is a hydrogen atom or a hydrocarbon residue containing 1 to 10 carbon atoms, n is an integer from 2 to 5, m is an integer from 1 to 4 and l is an integer from 1 to 30; and

kneading the resulting polymer with 90–65 parts by weight of (B) a tackifier, wherein said tackifier is liquid polybutene, 5 to 30 parts by weight of component (D) a filler and not more than 10 parts by weight of (E) a photopolymerization initiator, based on 100 parts by weight of a total of components (A) and (B).

4,548,688

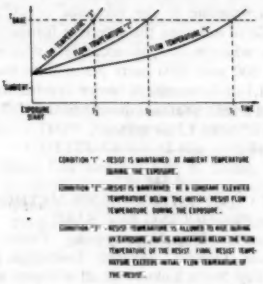
HARDENING OF PHOTORESIST

John C. Matthews, Columbia, Md., assignor to Fusion Semiconductor Systems, Rockville, Md.

Filed May 23, 1983, Ser. No. 497,466

Int. Cl.⁴ B32B *27/16*

U.S. Cl. 204—159.18 **10 Claims**



1. A method of hardening a positive photoresist which comprises exposing a film of positive photoresist material to UV radiation containing sufficient dosage of wavelengths of about 320 nm or below to cause said photoresist to harden while subjecting the film to elevated temperature upon increase in the degree of polymerization due to exposure to said UV radiation wherein said elevated temperature, at any instant during the said exposing, is below the flow temperature of the film at the particular instant, and wherein the resist is subjected to elevated temperature during the exposure to the UV radiation which is greater than the initial flow temperature of the resist at the start of the exposure to the UV radiation, and to thereby harden said positive photoresist.

4,548,689

PHOTOCURABLE RESIN COMPOSITION

Takeshi Sakashita, Iwakuni, and Takayuki Nakano, Otake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

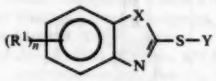
Filed Sep. 25, 1984, Ser. No. 654,243

Claims priority, application Japan, Sep. 28, 1983, 58-178109; May 29, 1984, 59-107512; May 29, 1984, 59-107513

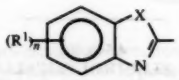
Int. Cl.⁴ C08F *2/50;* **A61K** *5/00*

U.S. Cl. 204—159.23 **13 Claims**

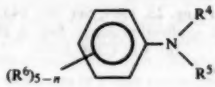
1. A photocurable composition comprising (a) a radical-polymerizable monomer, (b) an α-ketocarbonyl compound and (c) an amine, wherein the amine (c) is at least one member selected from the group consisting of compounds represented by the following general formula:



wherein X stands for $>NR^2$, an oxygen atom or a sulfur atom, Y stands for a hydrogen atom, $—SR^3$ or a monovalent, divalent or trivalent metal, R^1 stands for an alkyl group, an aryl group, an aralkyl group or a halogen atom, n is an integer of from 0 to 4 with the proviso that when n is 2 or larger, a plurality of groups R^1 may be the same or different, R^2 stands for a hydrogen atom, an alkyl group, an aryl group or an aralkyl group, and R^3 stands for an alkyl group or an aryl group, or a group represented by the following general formula:



wherein X, R^1 and n are as defined above, and substituted amines represented by the following general formula:



wherein R^4 stands for a hydrogen atom or an alkyl group, R^5 stands for a hydrogen atom, an alkyl group, a hydroxyalkyl group of an aryl group, R^6 stands for a monovalent, electron-attractive atom or organic group, and n is an integer of from 0 to 4.

4,548,690

PHOTOACTIVATED POLYMERIZATION OF VINYL MONOMERS IN THE PRESENCE OF POLYSILANES AND AMINES

Donald G. Peterson, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1984, Ser. No. 584,504

Int. Cl.⁴ C08F *2/50*

U.S. Cl. 204—159.23 **8 Claims**

1. A process which comprises subjecting a mixture of

(1) a vinyl monomer or prepolymer;

(2) a polysilane photoinitiator having a main chain of catenated silicon atoms and a molecular weight ($\overline{M}_n$) of from about 5×10^2 to 5×10^6 which absorbs electromagnetic energy in the wavelength range of from about 250 to 400 nanometers; and

(3) an organic amine activator to radiation in the range of about 250–400 nanometers until the degree of polymerization of the monomer or prepolymer has increased.

4,548,691
THERMALLY INSULATING GLAZING

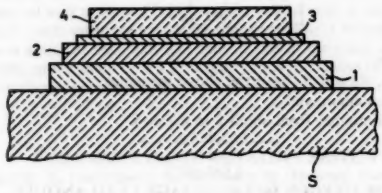
Anton Dietrich, Rodenbach; Klaus Hartig, Ronneburg; Werner Lenz, Langenselbold, and Michael Scherer, Rodenbach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,639

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307661

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—192 P 6 Claims



1. A method of producing glass sheets having good transmission behavior in the visible spectrum range and having good reflection behavior with respect to heat radiation, which comprises coating a transparent substrate, by cathodic atomization, with successive layers comprising

(a) a first oxide layer of indium oxide, tin oxide or a mixture thereof,

(b) a layer of silver having a thickness of 5 to 15 nm,

(c) a metallic intermediate layer, selected from aluminium, titanium, tantalum, chromium, magnesium and zirconium, applied directly to the silver layer in a thickness of between 1 and 5 nm, and

(d) a further oxide layer of indium oxide, tin oxide or a mixture thereof.

4,548,692
REDUCTION POT

Wilhelm Scharpey, Essen, Fed. Rep. of Germany, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Aug. 6, 1984, Ser. No. 638,275

Claims priority, application Switzerland, Aug. 25, 1983, 4633/83

Int. Cl.[4] C25C *3/08;* C25B *11/12*

U.S. Cl. 204—243 R 6 Claims

1. Reduction pot for producing aluminum by the fused salt electrolytic process, comprising an outer steel shell having a floor and sidewalls, a thermally insulating layer covering said shell, and an inner lining covering said layer made essentially of carbon with iron cathode bars embedded in it, wherein at least the lower 75% of the floor insulating layer is a mechanically compacted layer of a granulate material from replaced electrolytic cells comprised mainly of moler stone essentially of particle size ranging from 0.01 to 8 mm and containing the fully ground but otherwise untreated insulation layers substantially free from carbon residues, and wherein the remaining 0-25% is a layer selected from the group consisting of firebrick, ground firebrick, smelter alumina and mixtures thereof, and the sidewalls of the steel shell are insulated solely by firebrick.

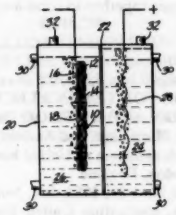
4,548,693
RETICULATE ELECTRODE FOR ELECTROLYTIC CELLS

Igor V. Kadija, and David D. Justice, both of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 490,812, May 2, 1983, Pat. No. 4,468,312, which is a division of Ser. No. 238,267, Feb. 25, 1981, Pat. No. 4,401,519. This application Jun. 6, 1984, Ser. No. 617,860

Int. Cl.[4] C25B *9/00, 11/03, 15/08*

U.S. Cl. 204—252 3 Claims



1. An electrolytic cell for the electrolysis of aqueous salt solutions in which a gaseous product is produced, said electrolytic cell having an anode compartment, a cathode compartment and a separator between said anode compartment and said cathode compartment, at least two electrodes, one electrode in said anode compartment, the other electrode in said cathode compartment, at least one of said electrodes being a reticulate electrode comprised of a network of electroconductive metal coated filaments having a porosity above about 80 percent, said reticulate electrode having a face and a back side, said back side having a non-continuous coating of a hydrophobic coating agent.

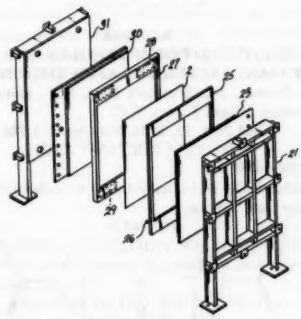
4,548,694
CATHOLYTELESS MEMBRANE ELECTROLYTIC CELL

Ronald C. Miles, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 502,411, Jun. 8, 1983, Pat. No. 4,488,947. This application Oct. 5, 1984, Ser. No. 657,915

Int. Cl.[4] C25B *1/46*

U.S. Cl. 204—257 11 Claims



1. A membrane electrolytic cell which comprises:

(a) a plurality of anodes, wherein each said anode is comprised of at least one foraminous surface and a frame enclosing said foraminous surface;

(b) a plurality of cathodes wherein each said cathode is comprised of at least one foraminous surface and a frame enclosing said foraminous surface, said cathodes being alternatingly interleaved with said anodes wherein said anode frames have a thickness at least 50 percent greater than the thickness of said cathode frames;

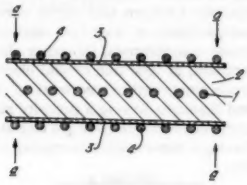
(c) a plurality of sheets of a cation exchange membrane, each of said sheets being pressed between each opposite pair of said anode frames and said cathode frames;
(d) raw material supply conduits to said anode frames and product withdrawal conduits communicating with the interior of each of said anode frames and said cathode frames;
(e) means for supplying electric current to said anodes and removing electric current from said cathodes; and
(f) pressing means for pressing said anode frames and said cathode frames together to form a substantially fluid-tight cell.

4,548,695

ELECTRODE FOR USE IN ELECTROCHEMICAL DEIONIZATION AND METHOD OF MAKING SAME

Nevill J. Bridger, Hermitage, and Andrew D. Turner, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 27, 1984, Ser. No. 675,327
Claims priority, application United Kingdom, Dec. 1, 1983, 8332089
Int. Cl.⁴ C25B *11/03*
U.S. Cl. 204—284 **8 Claims**



1. An electrode for use in electrochemical deionization comprising a current feeder support carrying an intimate mixture of an ion exchange material and a binder, the mixture having adhered thereto an inert, electrolyte-permeable outer envelope for maintaining the mixture in contact with the current feeder during use of the electrode in electrochemical deionization.

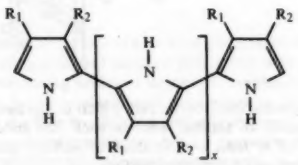
4,548,696

3,4-DISUBSTITUTED POLYPYRROLES AND ARTICLES OF MANUFACTURE COATED THEREWITH

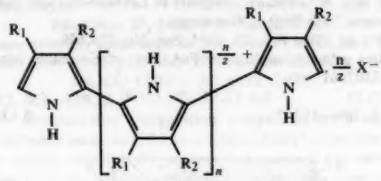
Otha G. Weaver, Jr., Travelers Rest, S.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Nov. 15, 1984, Ser. No. 671,780
Int. Cl.⁴ C25B *11/00, 3/02*
U.S. Cl. 204—290 R **11 Claims**

1. An electrically non-conducting 3,4-disubstituted polypyrrole having the formula:



wherein:
x is a positive integer greater than 4;
R_1 and R_2 may be the same or different, provided that (1) when R_1 and R_2 are different, one or R_1 and R_2 is CH_3 and the other of R_1 and R_2 is —$COOR_3$ or —$COCH_3$, wherein R_3 is CH_3, C_2H_5, C_3H_7 or t-C_7H_9 and (2) when R_1 and R_2 are the same they are C_4H_9, C_5H_{11} or C_6H_{13}
or an electrically conducting salt thereof having the formula:



wherein:
n, R_1, R_2 and R_3 have the above meanings,
X is an anion, and
Z is a number from about 3 to about 4.

4,548,697

LOW OXYGEN OVERVOLTAGE LEAD ANODES

Antonio Nidola, and Oronzio de Nora, both of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Jan. 6, 1984, Ser. No. 568,766
Claims priority, application Italy, Feb. 14, 1983, 19565 A/83
Int. Cl.⁴ C25B *11/00*
U.S. Cl. 204—290 R **18 Claims**

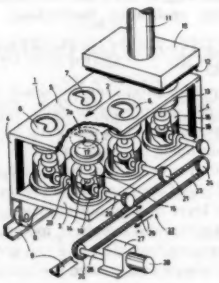
1. The process for preparing catalytic lead base anode having improved oxygen overvoltage wherein an antimony-free lead base is contacted with a molten bath of at least a hydrated salt belonging to the group of nitrates and persalts of a member of the group of cobalt, iron, and nickel, at a temperature lower than the melting temperature of the lead base and for a time sufficient to activate the surface of the lead base anode and wherein said antimony-free lead base exhibits improved oxygen overvoltage as a consequence of said process.

4,548,698

EQUIPMENT FOR PRODUCING COATINGS HAVING A ROTATIONALLY SYMMETRIC THICKNESS PROFILE BY CATHODIC EVAPORATION

Michael Sellschopp, Hammersbach, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,873
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306870
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—298 **5 Claims**



1. Apparatus for producing coatings on substrates by cathodic evaporation comprising: an evaporizing cathode; a

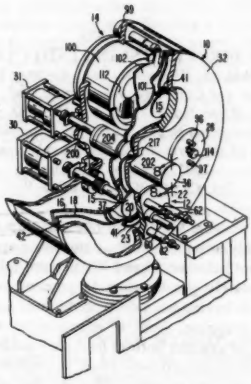
mask for each substrate; a rotatable substrate holder spaced from each mask; said coatings having a thickness profile that is symmetrical with respect to an axis of rotation; said mask having a cut-away portion for producing a predetermined coating-thickness profile by rotating the substrate about said axis; a common movable frame for mounting each mask and substrate holder associated with the mask; means for continuously rotating the substrate holder about said axis relative to said evaporizing cathode, said movable frame being displaceable during rotary movement of the substrate holder, said mask being arranged in a plane and having a central axis, said axis of rotation of said substrate holder being perpendicular to the plane of said mask and being coaxial to said central axis of the mask, each substrate executing simultaneously a rotary movement about its own axis and central axis of the mask and executing at the same time a translatory movement due to translatory displacement of said common movable frame.

4,548,699

TRANSFER PLATE ROTATION SYSTEM

Martin A. Hutchinson, Santa Clara; R. Howard Shaw, Palo Alto, and George Coad, Lafayette, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 17, 1984, Ser. No. 611,551
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 **18 Claims**



1. An apparatus for rotating a transfer plate inside a cylindrical vacuum chamber having front and back end walls and for translating a pressure plate, comprising:

a central hub attached to the inside of a front end wall of a vacuum chamber;

support means attached to said central hub whereby to support a back end wall of said vacuum chamber;

a transfer plate hub assembly attached to a transfer plate, said transfer plate hub assembly being formed around said central hub;

a pressure plate hub assembly attached to a pressure plate, said pressure plate hub assembly being formed around said transfer plate hub assembly;

a yoke attached to said pressure plate hub assembly and to a ram means for moving said yoke;

an actuating means;

a means for translating linear motion of said actuating means into rotary motion;

a rotary vacuum sealing feedthrough means having an axle which axle has a first end adapted to receive rotary motion from said means for translating linear motion into rotary motion;

a ratchet arm attached at a first end to a second end of said axle of said rotary vacuum sealing feedthrough means;

a ratchet tip attached to a second end of said ratchet arm; and

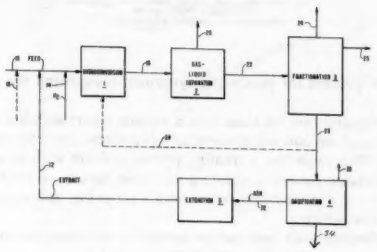
a transfer plate index socket attached to said transfer plate hub assembly and formed to engage said ratchet tip.

4,548,700

HYDROCONVERSION PROCESS

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,475
Int. Cl.[4] C10G *1/08;* C01G *31/00, 39/00*
U.S. Cl. 208—10 **13 Claims**



1. In a slurry hydroconversion process wherein a carbonaceous chargestock containing a catalyst or catalyst precursor comprising a metal selected from the group consisting of vanadium, molybdenum and mixtures thereof, is reacted with a hydrogen-containing gas at hydroconversion conditions to produce a hydroconverted oil product comprising solids containing said metals, separating a heavy oil portion comprising said metal-containing solids from said hydroconverted oil; gasifying at least a portion of said separated heavy oil portion to produce a metal-containing ash, the improvement which comprises contacting said metal-containing ash with oxalic acid to extract said metal from said ash, and adding at least a portion of the resulting metal-containing oxalic acid extract to said carbonaceous chargestock as catalyst precursor.

4,548,701

METHOD FOR EXTRACTION SOLVENT RECOVERY

William F. Wolff, Park Forest, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 19, 1983, Ser. No. 563,113
Int. Cl.[4] C10G *1/04*
U.S. Cl. 208—11 LE **32 Claims**

15. A method for recovery of bitumen from a bitumen containing material comprising: contacting a bitumen containing carbonaceous material with a halogenated organic solvent; separating spent material from the resulting solvent bitumen solution in the presence of an ammonium, Group metal, or Group II metal salt of an acid of carbon number 1 or 2 to evaporate the solvent and recover the bitumen and the solvent, wherein decomposition of the solvent and halogenation of the bitumen are minimized.

4,548,702

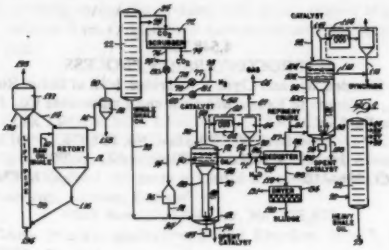
SHALE OIL STABILIZATION WITH A HYDROPROCESSOR

Earl D. York, Englewood; David M. Johnson, Littleton, both of Colo., and Paul B. Miller, Odessa, Tex., assignors to Standard Oil Company and Gulf Oil Corporation, both of Chicago, Ill.

Filed Feb. 24, 1984, Ser. No. 583,320

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—11 R **22 Claims**



1. A process for producing syncrude, comprising the steps of:

(a) feeding raw oil shale into a surface retort selected from the group consisting essentially of a screw conveyor retort with a surge bin, a rotating pyrolysis drum with an accumulator having a rotating trommel screen, a fluid bed retort, a static mixer retort with a surge bin, and a gravity flow retort;

(b) feeding solid heat carrier material at a temperature ranging from 1000° F. to 1400° F. into said retort;

(c) retorting said raw oil shale by contacting said raw oil shale with said solid heat carrier material in said retort at a temperature to liberate an effluent product stream comprising hydrocarbons, trace metals, and entrained particulates of raw, retorted an combusted oil shale dust ranging in size from less than one micron to 1000 microns; said trace metals comprising arsenic, iron, vanadium, and nickel;

(d) withdrawing said product stream from said retort;

(e) partially dedusting said product stream in at least one gas-solids separation device selected from the group consisting essentially of a cyclone and a filter;

(f) separating a shale oil fraction of normally liquid shale oil containing a substantial portion of said trace metals and from 1% to 65% by weight of said shale dust and a gaseous fraction comprising hydrocarbon gases and carbon dioxide from said partially dedusted product stream in at least one separator selected from the group consisting essentially of a fractionator, scrubber, and quench tower;

(g) feeding said shale oil fraction to a hydroprocessor;

(h) feeding a hydroprocessing catalyst to said hydroprocessor;

(i) injecting a hydroprocessing gas into said hydroprocessor;

(j) stabilizing, limiting polymerization, and partially upgrading said shale oil fraction while simultaneously removing a substantial portion of said trace metals from said shale oil fraction and agglomerating a substantial portion of said shale dust by contacting said shale oil fraction with said hydroprocessing gas in the presence of said hydroprocessing catalyst in said hydroprocessor under hydroprocessing conditions to form a stabilized shale oil fraction containing agglomerated shale dust and a hydrocarbon-enriched gaseous stream containing shale oil vapors leaving a spent hydroprocessing catalyst containing a substantial portion of said trace metals;

(k) removing said spent hydroprocessing catalyst from said hydroprocessor;

(l) removing said stabilized shale oil fraction from said hydroprocessor;

(m) withdrawing said hydrocarbon-enriched gaseous stream from said hydroprocessor;

(n) condensing and removing said stabilized shale oil vapors from said hydrocarbon-enriched gaseous stream;

(o) mixing said condensed stabilized shale oil vapors with said shale oil fraction to form a stream of stabilized shale oil;

(p) dedusting said stabilized shale oil by separating said stabilized shale oil in at least one deduster into a dedusted stream of stabilized shale oil and a dust enriched water stream of sludge containing most of said agglomerated dust;

(q) feeding and combusting said retorted shale and said dust enriched water stream of sludge to at least one combustor selected from the group consisting of a lift pipe combustor, a generally horizontal combustor, and a fluid bed combustor, to form combusted shale and sludge, respectively, for use as solid heat carrier material in steps (b) and (c); and

(r) removing nitrogen, oxygen and sulfur from said dedusted stream in at least one upgrading reactor selected from the group consisting of a hydrotreater, hydrocracker, and catalytic cracker in the presence of an upgrading catalyst under high severity upgrading conditions to form syncrude.

4,548,703

PITCH FOR DIRECT SPINNING INTO CARBON FIBERS

Ghazi B. Dickakian, Kingwood, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 399,750, Jul. 19, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 646,497

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.[4] C10C *3/00;* **D01F** *9/14*

U.S. Cl. 208—22 **7 Claims**

1. A pitch suitable for carbon fiber manufacture which can be spun directly into pitch fibers, comprising approximately by weight content between 80 and 100 percent toluene insolubles and approximately greater than 15 percent quinoline insolubles, said pitch having been derived, by heat soaking followed by vacuum stripping, from a substantially deasphaltenated fraction of a cat cracker bottom feedstock which is rich in 4, 5 and 6 polycondensed aromatic rings, and wherein said pitch is further characterized as being relatively free of impurities and ash.

4,548,704

PITCH FOR DIRECT SPINNING INTO CARBON FIBERS DERIVED FROM A STEAM CRACKER TAR FEEDSTOCK

Ghazi B. Dickakian, Greenville, S.C., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 399,751, Jul. 19, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 646,498

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.[4] C10C *3/00;* **D01F** *9/14*

U.S. Cl. 208—22 **5 Claims**

1. A pitch suitable for carbon fiber manufacture which can be spun directly into pitch fibers, comprising approximately by weight content between 80 and 100 percent toluene insolubles and greater than 15 percent quinoline insolubles, said pitch having been derived, by heat soaking followed by vacuum stripping, from a substantially deasphaltenated fraction of a steam cracker tar rich in 2, 3, 4, and 5 polycondensed aromatic rings, and wherein said pitch is further characterized as being relatively free of impurities and ash.

4,548,705
HYDROCRACKING WITH CATALYTICALLY ACTIVE AMORPHOUS SILICA AND ZEOLITES

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 526,866, Aug. 25, 1983, Pat. No. 4,481,102, which is a division of Ser. No. 356,351, Mar. 9, 1982, Pat. No. 4,414,137. This application Aug. 29, 1984, Ser. No. 645,920

Int. Cl.⁴ C10G *47/10, 49/08*

U.S. Cl. 208—111 **45 Claims**

1. A hydrocracking process comprising contacting a hydrocarbon in the presence of hydrogen under hydrocracking conditions including an elevated temperature and pressure with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

4. The process defined in claim **1** wherein said catalyst further comprises at least one hydrogenation component and at least one zeolite component.

26. A hydrodewaxing process comprising contacting a hydrocarbon under hydrodewaxing conditions with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

29. The process defined in claim **26** wherein said catalyst further comprises at least one hydrogenation component and at least one zeolite component.

30. The process defined in claim **29** wherein said zeolite component comprises a ZSM-5-type zeolite.

4,548,706
THERMAL CRACKING OF HYDROCARBONS

Christos G. Papadopoulos, Lisle, and Narasimhan Calamur, Willowbrook, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 26, 1983, Ser. No. 461,210

Int. Cl.⁴ C10C *9/14*

U.S. Cl. 208—130 **11 Claims**

1. In a method for thermally cracking a feed comprising at least one hydrocarbon selected from the group consisting of paraffins containing up to 10 carbon atoms, naphthas, gas oils and mixtures thereof, to thereby produce hydrogen, methane, olefins, naphthenes and aromatics, comprising:

passing the feed at a positive pressure into a reactor;

cracking the feed in the reactor at a temperature in the range of from about 425° C. to about 930° C. in the presence of steam at a steam-to-hydrocarbon weight ratio in the range of from about 0.2:1 to about 1.5:1;

pressurizing the reactor effluent in a compressor from substantially atmospheric pressure; and

fractionating the pressurized reactor effluent;

the improvement comprising cracking the feed in the reactor at a reactor pressure (1) such that the reactor outlet is maintained at a pressure, on an absolute pressure basis, that is at least 100 percent higher than the reactor outlet pressure which results when the reactor is operated at a pressure so as to maximize the yield of ethylene or propylene or both in the particular reactor and (2) such that either an increased yield of pyrolysis gasoline is afforded or substantially the same yield of pyrolysis gasoline is afforded but at reduced cracking severity, relative to cracking at the aforesaid reactor pressure at which the yield of ethylene or propylene or both is maximized in that particular reactor.

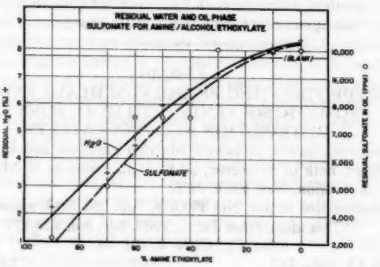
4,548,707
USE OF HIGH ETHOXYLATE LOW CARBON ATOM AMINES FOR SIMULTANEOUS REMOVAL OF SULFONATE SURFACTANTS AND WATER FROM RECOVERED CRUDE OIL

Nicholas O. Wolf, and Kang Yang, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Apr. 23, 1984, Ser. No. 602,856

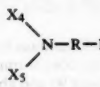
Int. Cl.⁴ B01D *17/04;* C10G *33/04*

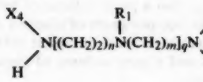
U.S. Cl. 208—188 **5 Claims**



1. A method for the simultaneous removal of sulfonate and water from emulsion with oil containing sulfonate and water comprising intimately contacting said emulsion with monoamines, diamines, triamines or mixtures of these, wherein the amines are water soluble amines having at least one general formula selected from the group consisting of

(1)


(2)


(3)

wherein X_1, X_2, and X_3 are, independently, hydrogen, hydrocarbon groups containing no more than 7 carbon atoms, CH_2CH_2OH, $CH_2CH(CH_3)OH$, and wherein X_4, X_5, X_6, and R^1 are, independently, hydrogen, straight, branched, cyclic or aromatic hydrocarbon groups containing no more than 7 carbon atoms, R is a straight, branched, cyclic, or aromatic hydrocarbon group containing no more than 7 carbon atoms, and wherein n and m are less than or equal to 7, and q is less than or equal to 20, which amines have been ethoxylated to a level of from about 40 to about 95% ethylene oxide by weight to form an ethoxylate, wherein such amine ethoxylates are present at a concentration from about 1×10^{-5} weight percent to about 10 weight percent, based on total emulsion weight, allowing the emulsion to separate into a sulfonate/water/ethoxylated amine phase and an oil phase, and recovering the oil phase.

4,548,708

PROCESS FOR REMOVING HYDROGEN SULFIDE FROM NATURAL GAS, OIL AND MIXTURES THEREOF

Hans Schwarzer, Wolfratshausen, and Werner Meisel, Geretsried, both of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Höllriegelskreuth, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,087

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151133

Int. Cl.[4] C10G *27/04;* C01B *17/033*

U.S. Cl. 208—196 7 Claims

1. A process for substantially complete elimination of hydrogen sulfide from the organic phase of natural gas, crude oil or mixtures thereof, consisting essentially of the step of

reacting, by mixing, the natural gas, crude oil or mixture thereof, with an aqueous reagent consisting essentially of 20 to 50% aqueous hydrogen peroxide, without the addition of any catalysts or organic compounds or of compounds that yield them, at a pressure of at least about 90 kPa gage and a reaction temperature of up to the decomposition temperature of hydrogen peroxide to remove the hydrogen sulfide from the organic phase.

4,548,709

HYDROTREATING PETROLEUM HEAVY ENDS IN AROMATIC SOLVENTS WITH DUAL PORE SIZE DISTRIBUTION ALUMINA CATALYST

Emmerson Bowes, Hopewell; Malvina Farcasiu, and Eric J. Y. Scott, both of Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 490,076, Apr. 29, 1983, abandoned. This application Jul. 5, 1984, Ser. No. 628,117

Int. Cl.[4] C10G *45/08, 45/60*

U.S. Cl. 208—213 12 Claims

1. A process for demetalizing and desulfurizing a residual oil which comprises:

(a) mixing said residual oil with an aromatic solvent;

(b) passing the resulting mixture of residual oil and solvent together with hydrogen in contact with a catalyst prepared by

(i) calcining an alpha alumina monohydrate or pseudo boehmite at a temperature of about 1400° F.,

(ii) mixing the resultant calcined product with between about 25 to about 185 percent of its own weight with uncalcined alumina monohydrate or pseudo boehmite; and

(iii) calcining the resultant mixture at a temperature of about 1400° F.; and

(iv) recovering a mixture of aluminas having two concentrations of pore sizes, one concentrated in the range of diameters of between about 90 and about 200 Angstrom units and having also a pore volume of between about 0.35 and about 0.7 cc per gram of alumina and a second having pore diameters between about 1000 and about 5000 Angstrom and a pore volume of about 0.2 cc per gram of alumina;

(c) recovering from the resulting product stream a residual oil having a substantially reduced sulfur and metals content obtained using substantially reduced amounts of hydrogen compared to known processes.

4,548,710

HYDROCARBON PROCESSING

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 453,991, Dec. 28, 1982, Pat. No. 4,460,707. This application Mar. 30, 1984, Ser. No. 595,052

Int. Cl.[4] C10G *45/04, 45/08*

U.S. Cl. 208—216 PP 54 Claims

1. A catalytic process for upgrading a hydrocarbon oil wherein said hydrocarbon oil is contacted under conditions of elevated temperature and pressure with a catalyst comprising one or more active metal components comprising Group VIB and Group VIII metals on a porous refractory oxide, said catalyst having at least about 60 percent of the total pore volume distributed in pores of diameter from about 180 to about 240 angstroms, with essentially all pores being of diameter greater than about 100 angstroms, and with less than about 10 percent of the total pore volume being in pores of diameter greater than about 300 angstroms.

4,548,711

SOLVENT EXTRACTION

Daniel M. Coombs, and Edward G. Latimer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 2, 1982, Ser. No. 414,111

Int. Cl.[4] C10C *3/08;* C10G *21/00, 21/30*

U.S. Cl. 208—309 14 Claims

1. A process for the solvent extraction of hydrocarbon materials from carbonaceous feeds using a contactor having upper, intermediate, and lower portions comprising the steps of:

(a) blending a minor amount of the total solvent with the feed;

(b) introducing at least a portion of the blend from step (a) into an intermediate portion of the contactor; and

(c) introducing the remainder of the solvent into the lower portion of the contactor, wherein the extraction is carried out under supercritical conditions with respect to the solvent employed.

4,548,712

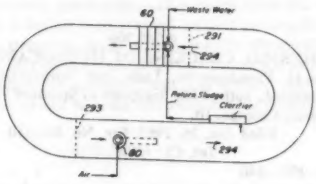
CONSERVATION OF MOMENTUM IN A BARRIER OXIDATION DITCH

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Division of Ser. No. 282,592, Jul. 13, 1981, , which is a division of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Sep. 30, 1982, Ser. No. 429,166

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—194 10 Claims



1. In an oxidation ditch comprising an endless channel having sides and a floor therebetween and containing circuit-flowing mixed liquor, the process of efficiently utilizing the total volume of said mixed liquor which is available within said endless channel for: (a) oxidizing NH_3—N in an inflowing raw wastewater stream to form nitrate ions by biological nitrification within an aerobic zone which contains a first portion of said total volume, (b) oxidizing five-day biological oxygen demand of said wastewater stream within both said aerobic zone and an anoxic zone which contains a second portion of said total volume, (c) denitrifying said nitrate ions within said anoxic zone, and (d) dependably providing an oxygen-deficient zone, as a third and final portion of said total volume:

A. providing a means for propulsion and point-source aeration of said mixed liquor, without back-mixing thereof, which independently controls the dissolved-oxygen content and the flow velocity of said mixed liquor, said propulsion and point-source aeration means being a directional-discharge pump/aerator;

B. operating pump/aerator to produce said aerobic zone which is disposed downstream of said pump/aerator and has a selectively located planar end where an anoxic zone begins;

C. providing a pump/circulator which is disposed close to said planar end and has no operative means for supplying oxygen to said mixed liquor, said pump/circulator being a directional-discharge device comprising a downward-pumping impeller, a vertically disposed downdraft tube within which said impeller is disposed and operates, and a discharge duct which is connected to the lower end of said downdraft tube and discharges in the downstream direction of said circuit-flowing mixed liquor;

D. operating said pump/aerator so that said planar end is selectively and constantly maintained approximately at said pump/circulator; and

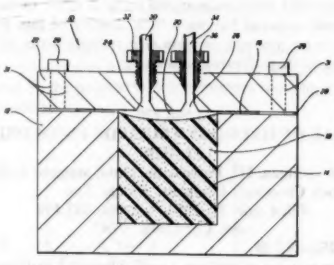
E. operating said pump/circulator to provide point-source mixing of said circuit-flowing mixed liquor with said inflowing raw wastewater stream and with return sludge, the terminus of said anoxic zone being disposed downstream of said pump/circulator and succeeded in the direction of flow of said circuit-flowing mixed liquor by said oxygen-deficient zone within which said mixed liquor is deficient in both dissolved oxygen and NO_3^- and NO_2^- anions and is ready for luxury uptake of oxygen within said pump/aerator.

4,548,713

PULSE DAMPER

Carl E. Schmid, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1984, Ser. No. 585,664
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **13 Claims**



1. A pulse damper for use in a liquid chromatographic system comprising, in combination:

a housing having a cavity therein;

a compliant elastomer material disposed in and substantially filling said cavity;

a cover disposed and shaped to completely overlie said cavity;

a diaphragm made of a flexible chemically inert material disposed between said housing and said cover;

said cover and said elastomer being shaped to form a flow volume disposed between said cover and said diaphragm;

means to secure said diaphragm and said cover to said housing;

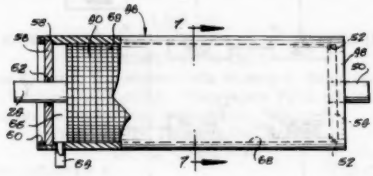
an inlet conduit and an outlet conduit each communicating with said flow volume, said inlet conduit, said flow volume and said outlet conduit providing a continuous path through which the fluid in the liquid chromatographic system can flow.

4,548,714

SEMIPERMEABLE MEMBRANE CARTRIDGE FOR USE WITH A PRESSURE CONTAINER

John R. Kirwan, Jr., Chula Vista, and Donald T. Bray, Escondido, both of Calif., assignors to Desalination Systems, Inc., Escondido, Calif.

Filed Oct. 11, 1983, Ser. No. 540,489
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—232 **2 Claims**



1. The combination of a spiral wound membrane cartridge and a pressure-resistant container for receiving said cartridge, said cartridge including a permeate collection tube with a spiral winding of a plurality of leaves each of which is a laminate of a semipermeable membrane sheet, a permeate transfer sheet and a porous grid sheet, only one of said leaves having an extension of said porous grid sheet of sufficient length to encompass the circumference of said cartridge whereby upon insertion of said cartridge into said container and release of said cartridge, said cartridge will undergo slight unwinding with the extension being in intimate, continuous contact with the interior surface of said container except along a single line at the free end of said extension,

said container including a cylinder having a closed end pierced by a liquid entry pipe with a spacer disposed adjacent said closed end to limit the extent of insertion of said cartridge to create an entry plenum,

said cylinder having an open end spaced from said closed end with an annular inner groove formed at said open end partially defined by a shoulder, said container further comprising a removable plate seating against said shoulder and held in position by a snap ring, said cartridge being spaced from said shoulder to form an exit plenum,

said permeate collection tube extending through a central hole in said plate and being sealed to said plate by means of an "o" ring.

4,548,715

PROCESS FOR AERATION OF EFFLUENTS IN EQUALIZING AND RESERVOIR BASINS

Theodor Stein, Kamen, Fed. Rep. of Germany, assignor to Schering AG, West Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 242,962, Mar. 12, 1981, abandoned. This application Sep. 3, 1981, Ser. No. 298,975
Int. Cl.[4] C02F *3/02*
U.S. Cl. 210—614 **12 Claims**

1. In a method for the biodegradation of a biodegradable industrial organic waste steam held under aeration in a basin, the improvement of operating essentially in the absence of flock by controlling the rate of oxidation of said organic waste by control of the oxygen level below that which will cause flocculation, said level resulting in minimum sludge formation.

4,548,716

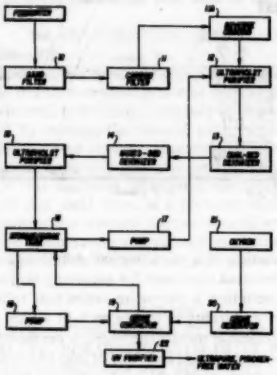
METHOD OF PRODUCING ULTRAPURE, PYROGEN-FREE WATER

Lucas Boeve, 31 Winchester Oval, New Rochelle, N.Y. 10805

Filed Jul. 25, 1984, Ser. No. 634,304

Int. Cl.[4] C02F *1/42, 1/78*

U.S. Cl. 210—652 **16 Claims**



1. A method of producing ultrapure, pyrogen-free water comprising:

(a) providing a source of water;

(b) filtering said water to remove suspended solids and organics;

(c) deionizing said water to remove dissolved solids; and

(d) introducing substantially pure ozone into said deionized water at a concentration of at least 2 milligrams of ozone per liter of deionized water to thereby produce ultrapure, pyrogen-free water.

4,548,717

METHOD FOR TREATING AQUEOUS SOLUTIONS WITH WEAKLY ACIDIC CATION EXCHANGE RESINS

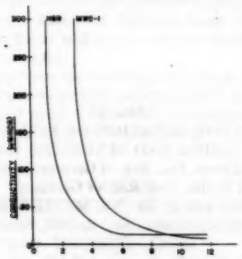
Robert Kunin, Yardley, Pa., and Eli Salem, Deal, N.J., assignors to The Graver Company, Union, N.J.

Filed Dec. 13, 1983, Ser. No. 560,814

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.[4] B01J *47/04*

U.S. Cl. 210—670 **35 Claims**



1. A method for removing impurities including ammonia and sodium ions from a liquid comprising the steps of:

(a) preparing a bed of filter materials including a cation exchange resin and an anion exchange resin, said cation exchange resin having a pK_a in the range of about 3.5 to 5.8; and

(b) passing the liquid through the bed at a temperature less than 200° F. and at a flow rate of less than about 75 gallons per minute per square foot to substantially remove the impurities and purify the liquid.

4,548,718

TREATING CYANIDE-CONTAINING EFFLUENTS

Colin W. A. Muir, Sandton, South Africa, assignor to Johannesburg Consolidated Investment Company Limited, Transvaal, South Africa

Filed Sep. 26, 1983, Ser. No. 535,569

Claims priority, application South Africa, Oct. 13, 1982, 82/7482

Int. Cl.[4] C02F *1/52, 1/70*

U.S. Cl. 210—719 **2 Claims**

1. A method of treating an effluent containing metal cyanide complexes and free cyanide to reduce the metal and cyanide content thereof including the steps of contacting the effluent with at least about 5 grams of powdered sulphur and at least about 11.5 grams of metallic iron for each 500 ml of effluent, at a pH of at least 8 and at a temperature of between 50° C. and the boiling point of the effluent, and filtering of the effluent to reduce the metal and cyanide content thereof.

4,548,719

METHOD FOR DEHYDRATING SLUDGE

Angelo Scordialo, Darmstadt, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,648

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215894

Int. Cl.[4] B01D *21/01, 29/00, 37/02*

U.S. Cl. 210—732 **6 Claims**

1. A method for dehydating sewage sludge by filtration using a filter aid, which method comprises adding a polyelectrolyte and from 2 to 10 kg of hydrophobized particulate thermally expanded volcanic material to each cubic meter of wet sludge, said material having a bulk density of less than 0.09 kg/liter an an average particle size ranging from 20 to 300 microns, and then filtering said sludge.

4,548,720

REMOVAL OF HYDROGEN SULFIDE FROM DRILLING FLUIDS

Thomas J. Gilligan, III, Painesville, Ohio, assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Apr. 21, 1983, Ser. No. 487,196

Int. Cl.[4] C09K *7/04*

U.S. Cl. 252—8.5 B **7 Claims**

1. In the process of drilling a well wherein a drilling fluid is circulated through a drill string and bit penetrating subterranean formations and back to the surface, the improvement which comprises adding to said drilling fluid a sufficient amount of $Ca(OCl)_2$ solid oxidant to scavenge hydrogen sulfide encountered in said subterranean formations without adversely altering the rheological properties of said drilling fluid.

4,548,721

METHOD OF ENHANCED OIL RECOVERY AND COMPOSITIONS USEFUL THEREIN

Francis E. DeBons, Richmond; Lawrence E. Whittington, Katy, both of Tex., and Larry D. Pedersen, Canal Winchester, Ohio, assignors to Getty Oil Company, Houston, Tex. and Reed Lignin, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 437,185, Oct. 27, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,370

Int. Cl.[4] E21B *43/22*

U.S. Cl. 252—8.55 D **26 Claims**

1. A method for the enhanced recovery of oil from a subter-

ranean formation containing oil and having at least one production well and at least one injection well comprising:

injecting into said formation a surfactant system comprised of an oil soluble amine modified lignin comprising the reaction product of a water soluble lignin selected from the group consisting of lignosulfonates and alkali lignins and an alkyl or aryl amine having from 6 to 66 carbon atoms, and a surfactant selected from at least one of the classes of anionic and nonionic surfactants, wherein the ratio of said amine modified lignin to said surfactant is from about 1 to 5 to about 5 to 1;

driving said surfactant system through said formation; and

producing the oil mobilized by said surfactant system through said production well.

4,548,722

DISPERSANT LUBRICATING OIL ADDITIVES

Timothy R. Erdman, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 519,784, Aug. 2, 1983, Pat. No. 4,521,319. This application Nov. 9, 1984, Ser. No. 670,520

Int. Cl.⁴ C10M *1/20, 1/32, 1/38*

U.S. Cl. 252—33 **5 Claims**

1. A lubricating oil additive prepared by reacting at a temperature of from 20° C. to 200° C. an oil-soluble hydrocarbyl-substituted polyamine containing at least one primary or secondary amino group with SO_2 wherein the amount of SO_2 employed is from 0.2 to 2 mols of SO_2 for every 2 moles of basic nitrogen present in said oil soluble hydrocarbyl-substituted polyamine.

4,548,723

ORTHO-CARBOXY PHENYLPHENONE LUBRICATING OIL ADDITIVES

Michael A. Shippey, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

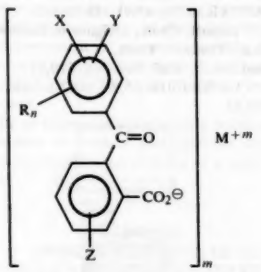
Filed Sep. 28, 1984, Ser. No. 656,042

Int. Cl.⁴ C10M *1/54*

U.S. Cl. 252—39 **10 Claims**

1. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.5% to 20% by weight of a product prepared by the process which comprises reacting a compound of formula I:

(I)



wherein R is alkyl of from 1 to 30 carbon atoms;

X, Y and Z are independently selected from hydrogen or hydroxy;

M is a metal selected from the group consisting of strontium, barium, calcium, magnesium, sodium and potassium;

m is an integer equal to the valence of M;

n is an integer from 1 to 3;

with the proviso that the sum of carbon atoms in all R be at least 10 carbon atoms; with from about 1 to about 50 equivalents of a basically reacting metal compound selected from the group consisting of

calcium oxide, hydroxide, or alkoxide of 1 to 3 carbon atoms;

magnesium oxide, hydroxide or alkoxide of 1 to 3 carbon atoms;

barium oxide, hydroxide or alkoxide of 1 to 3 carbon atoms;

sodium hydroxide or alkoxide of 1 to 3 carbon atoms;

potassium hydroxide of alkoxide of 1 to 3 carbon atoms; and

with 1 to 50 equivalents of carbon dioxide.

4,548,724

SUCCINIMIDE DERIVATIVES AS ADDITIVES IN LUBRICATING OILS

Thomas J. Karol, Wappingers Falls; Rodney L. Sung, Fishkill, and Benjamin J. Kaufman, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

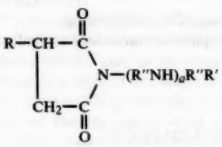
Filed May 29, 1984, Ser. No. 614,606

Int. Cl.⁴ C10M *1/32*

U.S. Cl. 252—51.5 A **50 Claims**

1. The method which comprises reacting

(i) a hydrocarbyl-substituted mono- or bis-succinimide bearing a polyamine

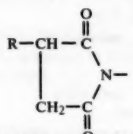


wherein

R is an alkenyl group containing about 8–400 carbon atoms;

R″ is a divalent hydrocarbon group selected from the group consisting of alkylene, alkarylene, aralkylene, cycloalkylene, arylene, alkenylene, and alkynylene

R′ is —NH_2, —NHR‴, or a hydrocarbyl-substituted succinimide group



R‴ is a hydrocarbon group selected from the group consisting of alkyl, alkaryl, alkaryl, alkenyl, alkynyl, cycloalkyl, and aryl;

a is an integer 1–8 with

(ii) an organic polycarboxylic acid R* $(COOH)_x$

wherein

x is an integer 3–6; and

R* is a hydrocarbon group derived from removing a-1 hydrogen atoms from an alkyl, alkaryl, aralkyl, cycloalkyl, aryl, alkenyl, or alkynyl hydrocarbon group thereby forming product; and recovering said product.

4,548,725

REDUCING LOW TEMPERATURE HAZE FORMATION OF HYDRODEWAXED BASE STOCKS

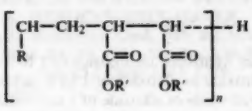
Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 18, 1983, Ser. No. 495,566

Int. Cl.⁴ C10L *1/28*

U.S. Cl. 252—56 R **10 Claims**

1. A method for lowering the cloud point of a hydrodewaxed mineral oil base stock which comprises adding to said base stock a cloud point lowering amount of a polymer having the formula



wherein R is a C_4 to C_{40} alkyl group, R′ is hydrogen or a C_4 to C_{40} alkyl group and n is 2 to 100.

4,548,726

WATER BASE HYDRAULIC FLUID

Betty J. Morris-Sherwood; Edward C. Brink, Jr., both of Port Arthur; David R. McCoy, and Edward E. McEntire, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

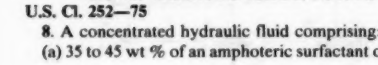
Filed Nov. 16, 1984, Ser. No. 672,045

Int. Cl.⁴ C09K *3/00;* **C10M** *3/04, 3/18, 3/26*

U.S. Cl. 252—75 **10 Claims**

8. A concentrated hydraulic fluid comprising:

(a) 35 to 45 wt % of an amphoteric surfactant of the formula:



(b) 8 to 12 wt % polypropylene glycol of molecular weight 200 to 600;

(c) triethanolamine, diethanolamine and modified phosphate ester in an amount sufficient to inhibit rust;

(d) phosphoric acid in an amount sufficient to inhibit aluminum corrosion;

(e) benzotriazole in an amount sufficient to inhibit copper corrosion; and

(f) water.

4,548,727

AQUEOUS COMPOSITIONS CONTAINING STABILIZED ENZYMES

Elias H. Shaer, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Oct. 6, 1983, Ser. No. 539,515

Int. Cl.⁴ C11D *3/386, 3/20;* **C12N** *9/96;* **C12R** *1/125*

U.S. Cl. 252—171 **20 Claims**

1. An aqueous-based enzyme containing composition wherein the enzymes have enhanced stability against loss of activity, the composition consisting essentially of on a weight basis:

(a) from 0 to about 55% of a surfactant selected from the group consisting of anionic and nonionic surfactants, and mixtures thereof:

(b) from about 0.006 to about 5% of an active enzyme selected from the group consisting of protease and alpha amylase enzymes, and mixtures thereof, said enzyme being provided in pure form or as incorporated within a commercial enzyme preparation comprising from 2 to about 80% of said enzyme and from about 20 to about 98% of a carrier therefor;

(c) from about 0.1% to about 2.5% of an ester of the formula RCOOR′ wherein R is an alkyl radical of from one to three carbons or hydrogen and R′ is an alkyl radical of from one to six carbon atoms; and

(d) the remainder water.

4,548,728

MASK CLEANSER CONTAINING OATMEAL, POWDERED MILK, BAKING SODA AND HONEY

Bernice E. Franklin, 4906 Adelia Dr., Chattanooga, Tenn. 37416

Filed Mar. 11, 1985, Ser. No. 710,088

Int. Cl.⁴ A61K *7/02;* **C11D** *7/40, 7/44, 7/46*

U.S. Cl. 252—174.14 **1 Claim**

1. A mask cleanser and skin softener for the hands and other skin surfaces which comprises a mixture of 2 cups of ingredients in the following approximate proportions dry oatmeal, 1½ cups of powdered milk, ½ cup of baking soda with ⅔ cup of honey and 1 cup of water to form a paste.

4,548,729

AQUEOUS FOAM-INHIBITING COMPOSITIONS CONTAINING ALKYL POLYETHYLENE GLYCOL ALKYL ETHERS

Karl Schmid, Mettmann; Horst Baumann, Leichlingen; Jürgen Geke, Düsseldorf; Hans-Günther Germscheid, Hösel; Werner Lüdecke, Erkrath; Robert Piorr, Ratingen; Christian Rossmann, Langenfeld; Rolf Scharf, Monheim, and Hans-Joachim Schlüssler, Haan, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,475

Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315951

Int. Cl.⁴ C11D *1/72*

U.S. Cl. 252—174.21 **9 Claims**

1. A foam-inhibiting composition for use in an aqueous solution consisting essentially of a mixture of (a) an alkyl polyethylene glycol alkyl ether having the formula

$$R^1—O—(CH_2CH_2O)_n—R^2$$

wherein R^1 is a member having from 8 to 18 carbon atoms selected from the group consisting of alkyl and alkenyl, R^2 is an alkyl having from 4 to 8 carbon atoms and n is an integer of from 7 to 12 and b) a polyglycerol polyethylene glycol alkyl ether of 1 part by weight of polyglycerol having a hydrcxyl number in the range of from 900 to 1200 adducted with from 4 to 20 parts by weight of ethylene oxide and etherified at the free hydroxyl group with alkyls having from 4 to 8 carbon atcms, in a ratio by weight of a:b of from 1:1 to 9:1.

4,548,730

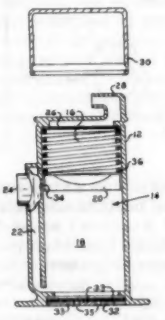
PORTABLE SELF-CONTAINED OXYGEN GENERATOR APPARATUS AND METHOD

Evan E. Koslow, Westport, Conn., assignor to Koslow Technologies Corporation, Westport, Conn.

Filed Jul. 5, 1983, Ser. No. 510,612

Int. Cl.⁴ A62D *9/00;* **C01B** *15/00;* **A62B** *7/00, 21/00*

U.S. Cl. 252—186.43 **6 Claims**



1. A formulation for the temperature controlled production of oxygen for medical use comprising an intimate mixture of an

oxygen-generating peroxy material and a heat-absorbing hydrated salt having an endothermic dehydration reaction temperature below 50° C., the weight ratio of the oxygen-generating material to the heat-absorbing hydrated salt falling within the range of about 1:2 to 2:1.

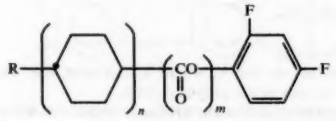
4,548,731

2,4-DIFLUOROBENZENE DERIVATIVES

Shigeru Sugimori, Fujisawa, and Tetsuhiko Kojima, Yokohama, both of Japan, assignors to Chisso Corporation, Ohsaka, Japan

Filed May 12, 1983, Ser. No. 494,032
Claims priority, application Japan, May 17, 1982, 57-82654; Jul. 27, 1982, 57-130867
Int. Cl.⁴ C09K *3/34;* **C07C** *25/13, 69/75*
U.S. Cl. 252—299.63 **9 Claims**

1. 2,4-Difluorobenzene derivatives of trans-4-alkylcyclohexanes expressed by the general formula



wherein m represents 0 or 1; and further wherein if m represents 1, then n represents 1 or 2 and if m represents 0, then n represents 2 and R represents an alkyl group of 1 to 10 carbon atoms.

4,548,732

PROCESS FOR ACIDIZING HOT SILICEOUS MATERIAL

Ronald F. Scheuerman, Bellaire, and Seth A. Silverman, Richmond, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1984, Ser. No. 601,538
Int. Cl.⁴ E21B *43/27*
U.S. Cl. 252—8.55 C **2 Claims**

1. A well treating process for dissolving an acid soluble siliceous solid material within a well environment which contains corrodable metal and is hotter than about 300° F. comprising:

compounding an aqueous acidizing solution to consist essentially of an aqueous solution which contains both a relatively high concentration of about 2 to 3 molar hydrogen fluoride equivalent of an ammonium fluoride and a concentration of weak acid and weak acid salt sufficient to provide a relatively high pH of at least about 5.5 but less than 7; and

flowing the so-compounded acidizing solution into said well environment to contact and dissolve said acid soluble siliceous material in the absence of a corrosion inhibiting material.

4,548,733

ANIONIC SILICONATES OF SILYLORGANOCARBOXYLATES, SULFONATES AND PHOSPHONATES TO REDUCE VISCOSITIES OF PARTICULATE SLURRIES

Harold L. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 5, 1984, Ser. No. 658,237
Int. Cl.⁴ C08J *5/54*
U.S. Cl. 252—310 **112 Claims**

1. A method of reducing the viscosity of particulate slurries which method comprises

(I) contacting an aqueous particulate slurry with an organosilicon compound selected from the group consisting of (i) anionic siliconates of silylorganophosphonates; (ii) anionic siliconates of silylorganosulfonates; and (iii) anionic siliconates of silylorganocarboxylates;

(II) intimately mixing the organosilicon compound and the slurry, whereby a slurry with a viscosity less than the viscosity of the slurry before contacting the organosilicon compound with the slurry, is obtained.

4,548,734

WATER SOLUBLE GUM/POLYMER COMPOSITIONS AND HYDROSOLS PREPARED THEREFROM

Jean-Bernard Chaux; Pierre Gagne, both of Tassin la Demi-Lune; Michel Garcia, Antony; Dominique Lespinasse, Jassans Riottier, and Josiane Roussos, Neuilly sur Seine, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 442,003, Nov. 16, 1982, abandoned. This application Jan. 25, 1983, Ser. No. 460,772
Claims priority, application France, Nov. 16, 1981, 81 21359
Int. Cl.⁴ B01F *3/18;* **B01J** *13/00;* **C08J** *3/06;* **C08L** *5/00*
U.S. Cl. 252—311 **25 Claims**

1. A composition of matter adapted for ready dispersion/dissolution in an aqueous medium, comprising intimate admixture of a water soluble gum or polymer, and a dispersion/dissolution enhancing amount of a water donor material therefore, the amount of water being such that the ratio by weight of the gum or polymer thereto ranges from 6.5 to 1, and the ratio by weight of the water donor to the water therein ranges from 0.3 to 2.6.

24. A sol comprising dispersion/solution of the composition of matter as defined by claim 1, in an aqueous medium.

4,548,735

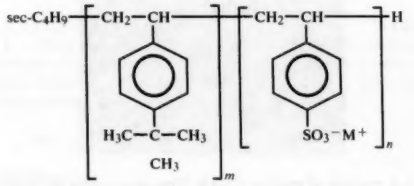
VISCOSITY ENHANCEMENT OF BLOCK POLYMER SOLUTIONS WITH OIL

Jan Bock, Bridgewater, and Paul L. Valint, Jr., Asbury, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

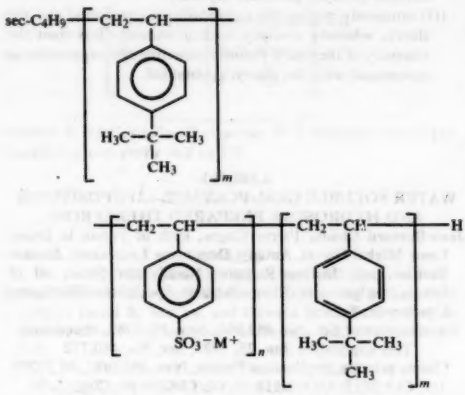
Filed Dec. 29, 1982, Ser. No. 454,241
Int. Cl.⁴ B01J *13/00*
U.S. Cl. 252—312 **3 Claims**

1. A process for the solubilization of a hydrocarbon liquid into an aqueous solution which comprises the steps of:

(a) forming said aqueous solution of water and a diblock polymer of t-butyl styrene/metal styrene sulfonate or a triblock polymer of t-butyl styrene/metal styrene sulfonated t-butylstyrene, said diblock polymer has the formula:



wherein m is about 0.5 to about 15.0 mole %, n is about 85.0 to about 99.5 mole %, and M is selected from the group consisting of hydrogen, and metals cations of iron, aluminum, lead, and Groups IA, IIA, IB and IIB of the Periodic Table of the Elements and having a molecular weight of about 100,000 to 3,000,000, said formula



wherein m is about 0.5 to about 15.0 mole %, n is about 85.0 t about 99.5 mole %, and M is selected from the group consisting of hydrogen, and metals cations of iron, aluminum, lead, and Groups IA, IIA, IB and IIB of the Periodic Table of Elements, and having a molecular weight of about 100,000 to 3,000,000, the concentration of said diblock or triblock polymer in said aqueous solution being about 0.005 to 5 grams of said diblock or triblock polymer per 100 grams of said water;

(b) adding about 0.002 to about 1.0 gram of a hydrocarbon liquid to 100 grams of said aqueous solution of said diblock or triblock polymer, said hydrocarbon liquid being selected from the group consisting of an aliphatic hydrocarbon having about 5 to about 7 carbon atoms, a cycloaliphatic hydrocarbon having about 5 to about 7 carbon atoms, an aromatic hydrocarbon having about 6 to about 20 carbon atoms, an aliphatic oil, a naphthenic oil and an aromatic oil; and

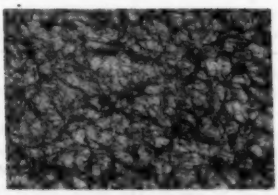
(c) stirring said hydrocarbon liquid and said aqueous solution of said diblock polymer of said triblock polymer until a homogeneous solution has been obtained.

4,548,736

PREPARATION OF PROTEIN FILMS

Michael F. Müller, Münster, Fed. Rep. of Germany, and John D. Ferry, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 29, 1983, Ser. No. 527,345
Int. Cl.[4] B01J *13/00*
U.S. Cl. 252—315.1 **20 Claims**



1. A method of making protein films comprising the steps of:

(a) preparing a protein gel in a solvent;

(b) placing the protein gel in contact with one side of a semipermeable membrane which is permeable to the solvent in which the gel was prepared;

(c) adding a concentrated polymer solution to the other side of the semipermeable membrane, which membrane is impermeable to the polymer, said polymer solution comprising a polymeric solute dissolved in a solvent to a concentration sufficient to cause osmosis of the solvent from the gel into the polymer solution; and

(d) removing solvent by osmosis from the gel for a period of time sufficient to contract the gel to a desired thickness.

4,548,737

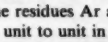
CONDUCTING POLYMERS

Denis G. H. Ballard, Littleton; Kenneth T. Moran, Runcorn, and Ian M. Shirley, Weaverham, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 6, 1984, Ser. No. 597,389
Claims priority, application United Kingdom, Apr. 6, 1983, 8309362
Int. Cl.[4] H01B *1/00*
U.S. Cl. 252—500 **4 Claims**

1. An electrically conducting composition comprising:

(a) a polyarylene of structure

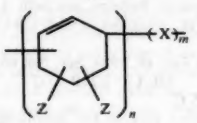


wherein

the residues Ar and X, where X is present, may vary from unit to unit in the polymer chain,

Ar represents a divalent aromatic or substituted aromatic group,

X is a residue of one or more polymerisable comonomers selected from the group consisting of styrene, methacrylates, vinyl halides, vinyl esters, acrylonitrile, tetrafluoroethylene, and sulphur dioxide, n and m are whole numbers and the ratio of n:m lies in the range of 1:0 to 1:100, which polyarylene is prepared from a poly (1,2-disubstituted cyclohexa-3,5-diene) of structure



wherein

the cyclohexenylene ring and the residue X, where X is present, may vary from unit to unit along the polymer chain,

each z, which may be the same or different, is amide, halide, thioester, urethane, xanthate, or OR^1, where R^1 is hydrogen, lower alkyl having up to five carbon atoms, aroyl, alkanoyl having up to ten carbon atoms or R^2OCO where R^2 is aryl or alkyl having up to ten carbon atoms, X, n and m have the meanings above-ascribed to them; and

(b) a suitable doping agent selected from the group consisting of Group IA metals, Group IA metal arenes, Bronsted acids, non-metal oxides, Group VB sulphides, and halides of Groups VB, VIA, IB, IIB, IVB and the inert gases.

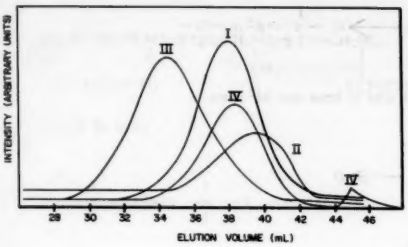
4,548,738

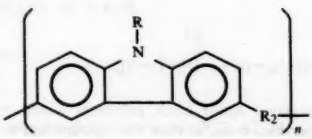
ELECTRICALLY CONDUCTING COMPLEXES OF POLY (3,6-N-ALKYLCARBAZOLYL ALKENES) AND METHOD OF MAKING

Samson A. Jenekhe, Bloomington, and Barbara J. Fure, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1984, Ser. No. 626,565
Int. Cl.[4] H01B *1/00*
U.S. Cl. 252—500 **32 Claims**

1. An electrically conducting polymer comprising poly(3,6-N-alkylcarbazolyl alkene) having the following structure:





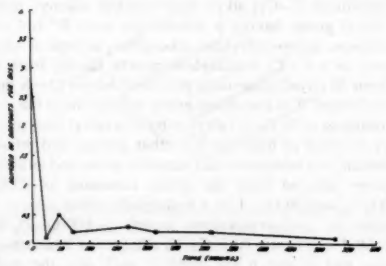
doped with a compatible charge transfer acceptor selected from the group consisting of I_2, Br_2, HI, HBr, IBr, BF_4^-, CLO_4^-, $SbCl_6$ or combinations thereof to provide electrical conductivity, wherein R is an alkyl group having from 1 to 3 carbon atoms, R_2 is an alkene group having from 1 to 3 carbon atoms, and n is an integer having a value between 2 and 500.

4,548,739

HIGH DENSITY INFORMATION RECORDS MADE OF CONDUCTIVE RESIN COMPOSITIONS COMPRISING A SPECIFICALLY-TREATED VINYL CHLORIDE-BASE RESIN

Mutsuaki Nakamura; Kazuhira Namikawa, both of Yokohama; Toshikazu Goshima, Sagamihara; Toshiaki Hamaguchi; Akio Kuroda, both of Yokohama; Akio Hata, and Noriki Fujii, both of Shinnanyo, all of Japan, assignors to Victor Company of Japan, Ltd. and Tokuyama Sekisui Industry Corporation, Ltd., both of, Japan

Filed Apr. 17, 1984, Ser. No. 601,098
Claims priority, application Japan, Apr. 20, 1983, 58-68437
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 **9 Claims**



1. A high density information record of the electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations, said substrate being made of a conductive resin composition comprising a vinyl chloride resin and a conductive powder, the vinyl chloride resin being obtained by suspension polymerization of vinyl chloride monomer in an aqueous solution containing a water-soluble polymer suspension stabilizer from whch insoluble organic matters with sizes over 10 μm have been removed.

4,548,740

METHOD OF PRODUCING CONDUCTIVE PLASTICS

Sybille von Tomkewitsch, Poecking, and Hans-Friedrich Schmidt, Eurasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,444
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301635
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 **13 Claims**

1. A process for producing a conductive plastic mixture comprising the steps of:

admixing a selected amount of a plastic material with a selected amount of a conductive material and extruding to obtain a substantially uniform extrudate of said materials;

measuring the electrical resistance of said extrudate;

adjusting the quantity of said conductive material relative to the quantity of said plastic material in accordance with a function of the difference between a desired resistance value for such extrudate and such so-measured resistance value thereby to achieve and maintain approximately said desired resistance value for said extrudate.

4,548,741

METHOD FOR DOPING TIN OXIDE

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 383,452, Jun. 1, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,572
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 **18 Claims**

8. A composition for the preparation of a conductive phase comprising an admixture of finely divided particles of (a) 5–95% by weight of a pyrochlore-related compound corresponding to the formula

$$Sn_{2-x}^{2+}Ta_{y3}Nb_{y2}Sn_{y1}^{4+}O_{7-x-y1/2}$$

wherein

x=0–0.55
y_3=0–2
y_2=0–2
y_1=0–0.5 and
$y_1+y_2+y_3=2$,

and (b) 95–5% by weight SnO_2.

4,548,742

RESISTOR COMPOSITIONS

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1983, Ser. No. 562,964
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—519 **6 Claims**

1. A thick film resistor composition comprising an admixture of finely divided particles of (a) 40–85% wt. of a conductive phase consisting essentially of 1–95% wt. of a pyrochlore corresponding to the formula:

$$Sn_{2-x}^{2+}Ta_{Y3}Nb_{Y2}Sn_{Y1}^{4+}O_{7-x-y_1^4},$$

wherein

x=0–0.55
Y_3=0–2
Y_2=0–2
Y_1=0–0.5 and
$Y_1+Y_2+Y_3=2$

or precursive mixtures thereof and 99–1% wt. SnO_2; (b)

60–15% wt. inorganic binder, and (c) 0.05–10% wt. $CoCrO_4$, $NiCrO_4$ or mixtures thereof, dispersed in (d) an organic medium.

4,548,743

KETAL AND USE IN PERFUMERY

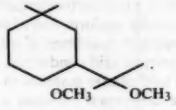
Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; William L. Schreiber, Jackson, and Michael Licciardello, Little Silver, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 20, 1984, Ser. No. 602,646

Int. Cl.[4] **A61K** *7/46;* **C11B** *9/00;* **C07C** *43/30, 43/32*

U.S. Cl. 252—522 R **2 Claims**

1. The dimethyl ketal of 1-acetyl-3,3-dimethyl cyclohexane defined according to the structure:



2. A process for augmenting or enhancing the aroma or a perfume composition, cologne or perfumed article comprising the step of intimately admixing with a perfume composition, cologne or perfumed article the compound of claim 1.

4,548,744

ETHOXYLATED AMINE OXIDES HAVING CLAY SOIL REMOVAL/ANTI-REDEPOSITION PROPERTIES USEFUL IN DETERGENT COMPOSITIONS

Daniel S. Connor, The Proctor & Gamble Co., Miami Valley Laboratories, Cincinnati, Ohio 45247

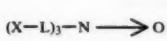
Filed Jul. 22, 1983, Ser. No. 516,612

Int. Cl.[4] **C07C** *135/02;* **C08F** *8/06;* **C11D** *1/75*

U.S. Cl. 252—545 **53 Claims**

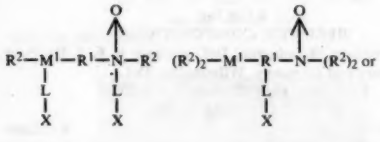
1. A water-soluble amine oxide having clay soil removal/anti-redeposition properties selected from the group consisting of:

(1) ethoxylated monoamine oxides having formula I:

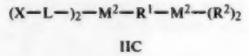


I

(2) ethoxylated amine oxides having formulas IIA, IIB or IIC:



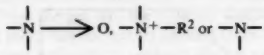
IIA IIB



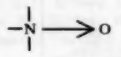
IIC

wherein M^1 is an

group; each M^2 is an

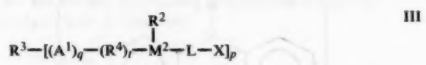


group, and at least one M^2 is an



group;

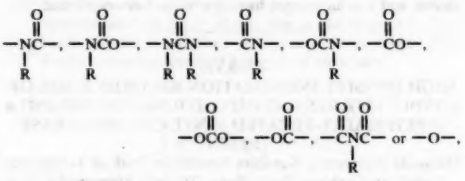
(3) ethoxylated amine oxides having formula III:



III

(4) ethoxylated amine oxide polymers which comprise a polymer backbone, at least 2M^3 groups and at least one L—X group, wherein M^3 is an amine oxide group attached to or integral with the backbone; and L connects groups M^3 and X, or connects group X to the polymer backbone; and

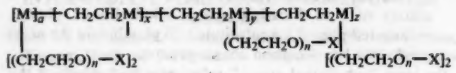
(5) mixtures thereof; wherein A^1 is



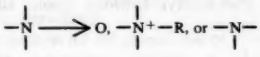
—O—, R is H or C_1–C_4 alkyl or hydroxyalkyl; R^1 is C_2–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—N bonds are formed; each R^2 is C_1–C_4 alkyl or hydroxyalkyl, the moiety —L—X, or two R^2 together form the moiety $-(CH_2)_r-A^2-(CH_2)_s-$, wherein A^2 is —O— or $-CH_2-$, r is 1 or 2, s is 1 or 2 and r+s is 3 or 4; R^3 is a substituted C_3–C_{12} alkyl, hydroxyalkyl, alkenyl, aryl or alkaryl group having p substitution sites; R^4 is C_1–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—N bonds are formed; X is a nonionic group selected from the group consisting of H, C_1–C_4 alkyl or hydroxyalkyl ester groups, C_1–C_4 alkyl or hydroxyalkyl ether groups, and mixtures thereof, or a mixture of said nonionic group and an anionic group selected from the group consisting of COO^-, PO_3^{3-} and SO_3^-; L is a hydrophilic chain which contains the polyoxyalkylene moiety $-[(R^5O)_m(CH_2CH_2O)_n]-$, wherein R^5 is C_3–C_4 alkylene or hydroxyalkylene, and m and n are numbers such that the moiety $-(CH_2CH_2O)_n-$ comprises at least about 50% by weight of said polyoxyalkylene moiety; n is at least about 12 for said monoamine oxides of formula I, is at least about 6 for said amine oxides of formulas IIA, IIB or IIC, is at least 3 for said amine oxides of formula III and is at least about 12 for said amine oxide polymers; p is from 3 to 8; q is 1 or 0; t is 1 or 0, provided that t is 1 when a is 1.

41. A water-soluble amine oxide polymer having clay soil removalanti-redeposition properties of formula XIII:

XIII

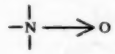


wherein M is an



group; R is C_1–C_4 alkyl or hydroxyalkyl, or the moiety $-(CH_2CH_2O)_n-X$; X is H,

—R^1 or a mixture thereof, wherein R^1 is C_1–C_4 alkyl or hydroxyalkyl; n is at least about 3; a is 1 or 0; a, x, y and z are numbers such that there are at least two M groups, at least two



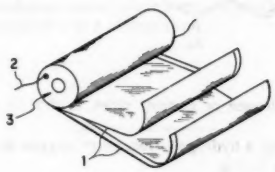
groups and at least two X groups.

4,548,745

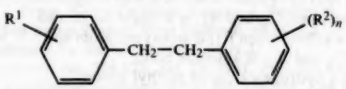
CAPACITOR COMPRISING METALLIZED POLYPROPYLENE FILM IMPREGNATED WITH A CERTAIN BIS-(ALKYLPHENYL) ALKANE

Takayuki Yagitani, Nishinomiya; Hiromasa Matsui, Ashiya; Akira Ito, Iwaki, and Toshishige Ueno, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,566
Claims priority, application Japan, Aug. 31, 1982, 57-151274
Int. Cl.[4] H01G *4/22, 4/32*
U.S. Cl. 252—567 **9 Claims**



1. A capacitor comprising, as a dielectric material, a metallized polypropylene film impregnated with a 1,2-bis-(alkylphenyl)ethane having the formula (I):



wherein R^1 represents a hydrogen atom or a methyl group; R^2 represents a methyl, ethyl, propyl or isopropyl group and n is 1 or 2, with the proviso that when R^1 represents a methyl group, R^2 represents a methyl group, and wherein the metallized polypropylene film is a rough-surfaced film having a space factor of 5 to 15%, said spaced factor being defined by the formula (II):

$$\frac{t_M - t_W}{t_W} \times 100 \qquad \text{(II)}$$

where t_M is the thickness of said film obtained by measuring the same with a micrometer and t_W is the thickness of said film obtained by the gravimetric method.

4,548,746

ROSIN PENTAERYTHRITOL ESTER PREPARATION IMPROVEMENT

Don P. Duncan, Mt. Pleasant, and Timothy B. Cameron, North Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 610,131, May 14, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 679,985
Int. Cl.[4] C09F *7/00, 1/04*
U.S. Cl. 260—104 **17 Claims**

1. A process for esterifying rosin with at least an equivalent of pentaerythritol which comprises heating the rosin and pentaerythritol in the presence of phosphinic acid catalyst.

15. A tall oil rosin ester prepared by reacting a tall oil rosin with a 15–18% excess equivalent of pentaerythritol by heating the rosin and the pentaerythritol in an inert environment for from 18 to 20 hours at from 250° to 280° C. in the presence of from 0.01% to less than 0.5% phosphinic acid catalyst, followed by a steam sparge and the addition of sodium hydroxide in an amount sufficient to neutralize the phosphinic acid wherein the tall oil rosin ester exhibits both a color of 0–2 Gardner color units above the color of the tall oil rosin and a Ball and Ring softening point of from 95° C. to 105° C.

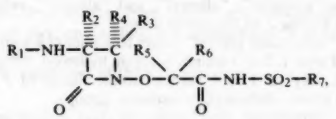
4,548,747

3-ACYLAMINO-1-SULFONYLAMINOCARBONYLMETHOXY-2-AZETIDINONES

Robert Zahler, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 2, 1983, Ser. No. 490,274
Int. Cl.[4] C07D *205/08, 401/12, 403/12;* **A61K** *31/395*
U.S. Cl. 260—239 A **12 Claims**

1. A β-lactam having the formula

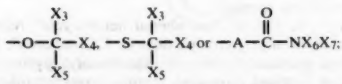


or a pharmaceutically acceptable basic salt thereof, wherein

R_1 is an acyl group derived from a carboxylic acid;

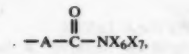
R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4,5,6 or 7-membered heterocycle or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $-CH_2X_1$, $-S-X_2$, $-O-X_2$,



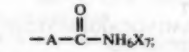
wherein X_1 is azido, amino, hydroxy, alkanoylamino, phe-

nylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



—S—X_2 or —O—X_2; X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is —CH=CH—, —$(CH_2)_n$—, —CH_2—O—, —CH_2—NH— or —CH_2—S—CH_2—; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle; and

R_5 and R_6 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, phenyl, substituted phenyl, cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or R_5 and R_6 together with the carbon atom to which they are attached are cycloalkyl or a 4, 5, 6 or 7-membered heterocycle or one of R_5 and R_6 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, —CH_2X_1, —S—X_2, —O—X_2, or



and R_7 is alkyl, substituted alkyl, phenyl or substituted phenyl;

wherein the terms "alkyl" and "alkoxy" refer to grounds having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the terms "alkanoyl", "alkenyl", and "alkynyl", refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carbamyl, or carboxyl groups;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (heteroaryl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolylidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula —NY_1Y_2 wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino.

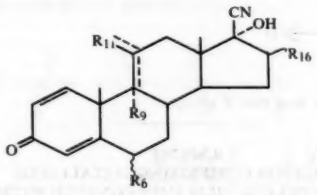
4,548,748

CYANOHYDRIN PROCESS

Verlan H. Van Rheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

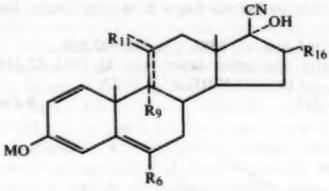
Filed Feb. 3, 1984, Ser. No. 576,674
Int. Cl.[4] C07J 5/00
U.S. Cl. 260—239.55 C **18 Claims**

1. A 17β-cyano-17α-hydroxy steroid of the formula



(IB)

and its C_3 protected enolate



(IBa)

where

R_6 is a hydrogen or fluorine atom, methyl or methylene group;

R_9 is nothing, a hydrogen, fluorine or oxygen atom, which makes the C-ring

(a) $\Delta^{9(11)}$ when R_9 is nothing and

(b) 9β,11β-epoxide when R_9 is an oxygen atom;

R_{11} is a hydrogen or oxygen atom, two hydrogen atoms, or α- or β-hydroxyl group which makes the C-ring

(a) $\Delta^{9(11)}$ when R_{11} is a hydrogen atom,

(b) 9β,11β-epoxide when R_{11} is an oxygen atom and .... between C_{11} and R_{11} is a single bond, and

(c) a ketone when R_{11} is an oxygen atom and .... between C_{11} and R_{11} is a double bond;

R_{16} is a hydrogen atom or methyl group;

.... is a single or double bond;

~ indicates that the attached atom or group can be in either the α or β configuration; and

M is a lithium, sodium, potassium, magnesium or calcium atom.

4,548,749

PROCESS FOR THE PREPARATION OF 21-HYDROXY-20-KETO-Δ^{16}-STEROIDS AND NEW INTERMEDIATE COMPOUNDS FORMED IN THIS PROCESS

Albert M. van Leusen, Groningen, and Adriaan M. van Leusen, Winsum, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 27, 1984, Ser. No. 604,735

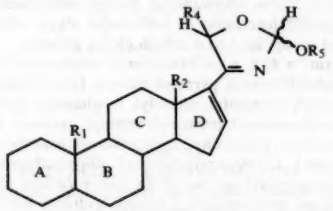
Claims priority, application European Pat. Off., Apr. 29, 1983, 83200618.3

Int. Cl.[4] C07J *9/00*

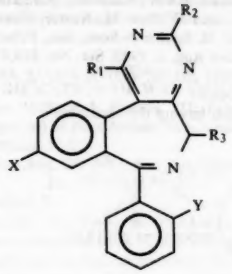
U.S. Cl. 260—239.5 **30 Claims**

1. A process for the preparation of 21-hydroxy-20-keto-Δ^{16}-steroids comprising reacting a 17-(isocyanosulfonylmethylene)-steroid with an aldehyde and an alcohol to form a 17-(2-alkoxy-3-oxazolin-4-yl)-Δ^{16}-steroid and subjecting the latter to hydrolysis to obtain the corresponding 21-hydroxy-20-keto-Δ^{16}steroid.

29. A compound of the formula



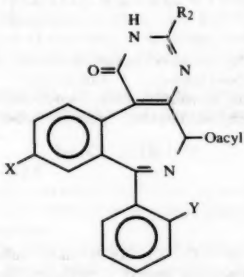
wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms or may form a double bond in the 1(10), 5(10) or 9(10) position, R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_3 is selected from the group consisting of alkyl of 1 to 10 carbon atoms, dialkylamino of 1 to 8 alkyl carbon atoms, heterocycle of 4 to 8 atoms optionally containing an oxygen atom and aryl optionally substituted with at least one member of the group consisting of halogen and alkyl and alkoxy of 1 to 6 carbon atoms and the A,B,C and D rings may contain at least one double bond and may be optionally substituted with at least one member of the group consisting of hydroxy, amino, oxygen, halogen, alkyl and alkylene and alkoxy of 1 to 6 carbon atoms and alkoxyalkoxy of 2 to 6 carbon atoms and optionally disubstituted with at least one member of the group consisting of epoxy, methylene and alkylenedioxy and alkylenedithio and alkyleneoxythio of 1 to 3 carbon atoms.



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, chloro, bromo, lower alkoxy, lower alkyl substituted thio and NR_4R_5 wherein R_4 and R_5 are hydrogen, lower alkyl and di-substituted lower alkylamino lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl and amino; R_3 is selected from the group consisting of hydrogen, acetyloxy, benzoyloxy and hydroxy; X is halogen and Y is hydrogen or halogen and the N-oxides thereof when R_3 is hydrogen

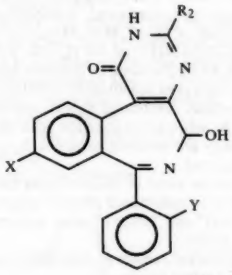
and the pharmaceutically acceptable salts thereof.

3. A compound of the formula



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl and amino; X is halogen and Y is hydrogen or halogen.

4. A compound of the formula



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl and amino; X is halogen and Y is hydrogen or halogen.

4,548,750

PYRIMIDO[4,5-D][2]BENZAZEPINES USEFUL AS SEDATIVES AND ANXIOLYTIC AGENTS

Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 286,123, Jul. 23, 1981, Pat. No. 4,427,589, which is a continuation-in-part of Ser. No. 175,554, Aug. 5, 1980, abandoned. This application Oct. 17, 1983, Ser. No. 542,329

Int. Cl.[4] C07D *487/04*

U.S. Cl. 260—243.3 **7 Claims**

1. A compound of the formula

4,548,751

(2-OXO-1-AZETIDINYLOXY)-2-PROPENOIC ACID

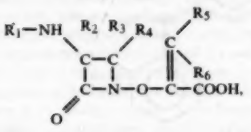
Spencer D. Kimball, North Brunswick, N.J.; David Kronenthal, Yardley, Pa., and William H. Koster, East Amwell, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 3, 1983, Ser. No. 519,874

Int. Cl.[4] **C07D** *205/08, 403/12, 401/12;* **A61K** *31/395*

U.S. Cl. 260—245.4 **9 Claims**

1. A compound having the formula

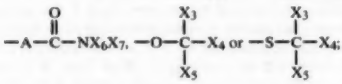


or a pharmaceutically acceptable salt or ester thereof, wherein

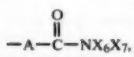
R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, $—CH_2X_1$, carboxyl, $—S—X_2$, $—O—X_2$,



wherein X_1 is azido, amino, hydroxy, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$—S—X_2$ or $—O—X_2$; X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroaryl carbonyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4, when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $—CH{=}CH—$, $—(CH_2)_n—$, $—CH_2—O—$, $—CH_2—NH—$ or $—CH_2—S—CH_2$; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle; and

R_5 and R_6 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl; wherein

the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), alkoxy (of 1 to 4 carbon atoms) or carboxyl groups;

the term "substituted amino" refers to a group having the formula NY_1Y_2 wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazoyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups.

4,548,752

CHEMICAL COMPOSITIONS AND METHODS

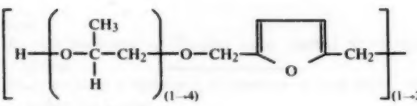
William J. Pentz, Cary, Ill., assignor to QO Chemicals, Inc., Chicago, Ill.

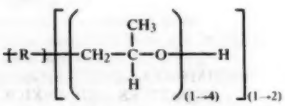
Division of Ser. No. 291,446, Aug. 10, 1981, Pat. No. 4,426,460. This application Nov. 14, 1983, Ser. No. 535,252

Int. Cl.[4] **C08G** *18/14*

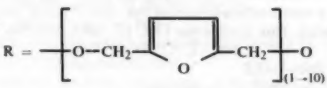
U.S. Cl. 260—330.9 **11 Claims**

1. A chemical composition having the formula:





wherein



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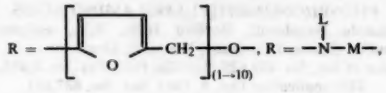
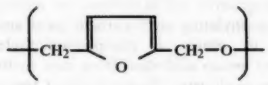
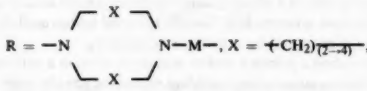
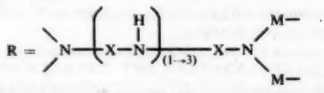


where L is lower alkyl or M, and M is







4,548,753

2,3-BUTANEDIOL DIESTER DERIVATIVES

Susumu Satoh, Chiba; Kinichi Mogi, Abiko; Saburo Murakami, Chiba, and Toshiaki Nakashima, Shisui, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

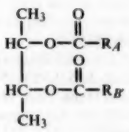
Continuation of Ser. No. 333,772, Dec. 23, 1981, Pat. No. 4,469,704. This application Jan. 20, 1984, Ser. No. 572,242

Claims priority, application Japan, Dec. 26, 1980, 55-186144; Jun. 4, 1981, 56-86034; Jul. 14, 1981, 56-109778; Oct. 2, 1981, 56-157110

Int. Cl.⁴ C09F *5/08*

U.S. Cl. 260—410 **13 Claims**

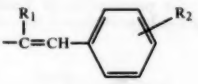
1. A 2,3-butanediol diester represented by the formula (II):



(II)

wherein

R_A is an alkyl group, an alkenyl group or a group represented by the formula



R_1 is hydrogen, cyano or lower alkyl,

R_2 is hydrogen, halogen, lower alkyl, lower alkyloxy or lower acyloxy; and

R_B is a phenyl group substituted with lower alkyl, lower alkoxy or halogen; phenyl alkyl, phenyl propenyl, phenyloxy alkyl, or a group represented by the formula

wherein

R_3 is hydrogen, halogen, cyano, lower alkyl or phenyl,

R_4 is hydrogen, lower alkyl or phenyl, and

R_5 is a phenyl group which may be substituted with lower alkyl, lower alkyloxy, acyloxy or halogen.

4,548,754

ESTERIFICATION OF WAX OXIDATES

Frederic F. Day; William J. Powers, III; Eric D. Ewen, and Gerald L. Piper, all of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,844

Int. Cl.⁴ C11C *3/02*

U.S. Cl. 260—410.9 R **11 Claims**

1. A method for esterifying an unsweated, oil containing wax oxidate comprising the steps of contacting said unsweated wax oxidate; said wax oxidate formed from the air oxidation of a petroleum derived wax and said wax oxidate having a melting point between 40° C. and 55° C., a saponification number between 125 and 175, a flash point COC of 135° C. minimum, a neutralization number between 70 and 95, a maximum ASTM color of 5, a maximum ash content of 0.05 percent by weight and a kinematic viscosity at 100° C. of 4 to 10 centiStokes, with an alcohol and with an organic sulfonic acid under effective esterifying temperature and pressure conditions; washing said organic sulfonic acid with water from said resulting reaction mixture; and separating the acid containing water layer and the ester containing organic layer.

4,548,755

PROCESS FOR THE EXTRACTIVE PRODUCTION OF VALUABLE NATURAL WAXES

Egon Stahl, Saarbrücken-Scheidt, and Karl-Werner Quirin, Dillingen, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,490

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207914

Int. Cl.⁴ C11B *1/10*

U.S. Cl. 260—412.8 **16 Claims**

1. Process for extractive production of natural wax from starting materials obtained from fossil, vegetable or animal sources, comprising

extracting the starting materials with a physiologically unobjectional gas at supercritical pressure and temperature conditions; and, thereafter,

separating the extract from the gas by changing the pressure and/or temperature conditions.

4,548,756

OXIME ETHERS

Henry Martin, Allschwil, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

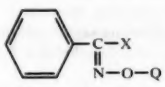
Continuation of Ser. No. 431,462, Sep. 30, 1982, abandoned, which is a division of Ser. No. 129,499, Mar. 11, 1980, Pat. No. 4,466,822, which is a division of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Dec. 7, 1984, Ser. No. 679,156

Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 8, 1978, 1348/78

Int. Cl.⁴ C07C *121/80*

U.S. Cl. 260—465 E **14 Claims**

1. A compound of the formula

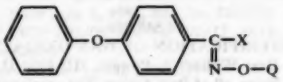


wherein

X is hydrogen or methyl, and

Q is cyanomethyl, methoxycarbonylmethyl, isopropoxycarbonyleth-1-yl or carbamoylmethyl.

6. A compound of the formula



wherein

X is hydrogen, methyl or ethyl, and

Q is cyanomethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, methoxycarbonyleth-1-yl or carbamoylmethyl.

4,548,757

AQUEOUS AMINOMETHYLENEPHOSPHONIC ACID SOLUTIONS CONTAINING ORGANIC CARBOXYLATE STABILIZING AGENT

Jean Wevers, Grimbergen; Hubert Ernst, Brussels; Stephen Cassidy, Tervuren, and Christian R. Barrat, Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 26, 1985, Ser. No. 705,573

Claims priority, application United Kingdom, Mar. 2, 1984, 8405573

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.5 E **5 Claims**

1. An aqueous solution of an aminomethylenephosphonic acid, wherein the main phosphonate ingredient is diethylenetriaminepenta(methylenephosphonic acid), containing 2–12% residual hydrochloric acid originating from the manufacturing process, and a crystallization inhibitor which inhibitor is an alkali-metal salt of an organic carboxylic acid, with the proviso that the equivalent molar concentration ratio of carboxylic acid salt to hydrochloric acid is greater than 1.

4,548,758

PREPARATION OF PHOSPHONOMETHYLATED AMINO ACIDS

Sreeramulu Nagubandi, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 30, 1984, Ser. No. 645,587

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.5 F **18 Claims**

1. A process for preparing a phosphonomethylated amino acid comprising: phosphonomethylating an N-sulfonylglycine derivative to obtain a phophonomethylated N-sulfonylglycine derivative; and hydrolyzing said phosphonomethylated N-sulfonylglycine derivative to obtain a phosphonomethylated amino acid or acid derivative.

4,548,759

PREPARATION OF PHOSPHONOMETHYLATED AMINO ACIDS

Sreeramulu Nagubandi, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 30, 1984, Ser. No. 645,735

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.5 F **9 Claims**

1. A process for preparing a phosphonomethylated amino acid comprising:

(a) reacting a glycine derivative with a halosulfonic acid to form a N-sulfonylglycine derivative;

(b) phosphonomethylating said N-sulfonylglycine derivative to obtain a phosphonomethylated N-sulfonylglycine derivative; and

(c) hydrolyzing said phosphonomethylated N-sulfonylglycine derivative to obtain a phosphonomethylated amino acid or acid derivative.

4,548,760

PROCESS FOR PREPARING PHOSPHONOMETHYLATED AMINO ACIDS

Sreeramulu Nagubandi, Bedford Hills, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 489,627, Apr. 28, 1983, Pat. No. 4,491,548. This application Oct. 4, 1984, Ser. No. 657,561

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.5 F **8 Claims**

1. A process for preparing a phosphonomethylated amino acid comprising:

phosphonomethylating an N-carbamylated amino acid derivative to obtain a phosphonomethylated N-carbamylated amino acid derivative; and hydrolyzing said phosphonomethylated N-carbamylated amino acid derivative to obtain a phosphonomethylated amino acid or acid derivative wherein said N-carbamylated amino acid derivative is prepared by a process comprising:

suspending a primary amino acid derivative in a solvent to obtain a suspension; bubbling phosgene gas through said suspension to form an isocyanate; and reacting said isocyanate with an alcohol to obtain an N-carbamylated amino acid derivative.

2. A process for preparing a phosphonomethylated amino acid comprising:

phosphonomethylating an N-carbamylated amino acid derivative to obtain a phosphonomethylated N-carbamylated amino acid derivative; and hydrolyzing said phosphonomethylated N-carbamylated amino acid derivative to obtain a phosphonomethylated amino acid or acid derivative wherein said N-carbamylated amino acid derivative is prepared by a process comprising:

dissolving phosgene gas in a solvent to obtain a phosgene-containing solvent; adding a primary amino acid derivative dissolved in triethylamine to said phosgene-containing solvent to form a carbamyl chloride; and reacting said carbamyl chloride with an alcohol to obtain an N-carbamylated amino acid derivative.

4,548,761

PROCESS FOR THE PREPARATION OF 1-AMINOBENZENE-2-SULPHONIC ACIDS

Martin Michna, and Hermann Henk, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

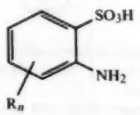
Filed Jun. 8, 1983, Ser. No. 502,077

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224155

Int. Cl.⁴ C07C *143/58*

U.S. Cl. 260—508 **6 Claims**

1. Process for the preparation of 1-aminobenzene-2-sulphonic acid of the formula

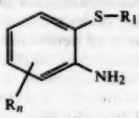


wherein

R=H, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, nitro, sulfo, CN, Cl, OH, SH, NH_2, naphthotriazolyl-2- or benzotriazolyl-2- and

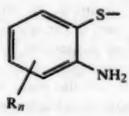
n=1–4,

and a salt thereof, by oxidation of a compound of the formula



wherein

R_1=H, a cation, or a radical of the formula



characterised in that the oxidation is carried out in a pH range of 8–14.

4,548,762

PROCESS FOR THE PREPARATION OF VINYLPHOSPHONIC ACID DICHLORIDE AND 2-CHLOROETHANEPHOSPHONIC ACID DICHLORIDE

Hans-Jerg Kleiner, Kronberg, and Walter Dürsch, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 297,734, Aug. 31, 1981, abandoned. This application Feb. 4, 1983, Ser. No. 463,993

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033614

Int. Cl.[4] C07R *9/42*

U.S. Cl. 260—543 P **5 Claims**

1. A process for the preparation of vinylphosphonic acid dichloride and 2-chloroethanephosphonic acid dichloride which consists essentially of heating a 2-chloroethanephosphonic compound containing 2-chloroethyl ester groups to 150°–230° C. in a first step, with cleavage of dichloroethane and formation of a vinylphosphonic compound as a reaction product of said first step, and in a second step, reacting the said reaction product with phosgene at 90°–200° C., in the presence of a basic catalyst, or of an alkali metal salt as catalyst, and in the presence of a phosphonic acid dichloride.

4,548,763

PREPARATION OF VINYLPHOSPHONATE DIESTERS

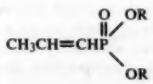
David Nalewajek, West Seneca; David S. Soriano, Cheektowaga, and Ralph J. Borowski, Depew, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 5, 1983, Ser. No. 557,782

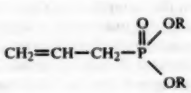
Int. Cl.[4] C07F *9/40*

U.S. Cl. 260—989 **10 Claims**

1. A method for the preparation of a vinylic phosphonate diester of the formula:



from a corresponding allyl phosphonate diester of the general formula



wherein R is an alkyl substituent of 1 to 7 carbon atoms, which comprises:

(a) reacting said allyl phosphonate diester in the presence of a catalytic amount of a ruthenium metal hydride until at least 85% isomerization of starting allyl phosphonate diester is effected.

4,548,764

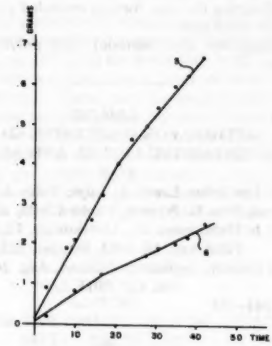
INSECT REPELLENT, PHEREMONAL, ANIMAL REPELLENT, DIAGNOSTIC OR AROMA ENHANCING COMPOSITIONS CONTAINING POLY(EPSILON CAPROLACTONE) HAVING EMBEDDED THEREIN FUNCTIONAL SUBSTANCES.

Marina A. Munteanu, New York, N.Y.; Edward S. Oltarzewski, Mercerville, N.J.; Leon Shechter, Summit, N.J., and Craig B. Warren, Rumson, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 563,771, Dec. 21, 1983, Pat. No. 4,496,467, which is a division of Ser. No. 468,997, Feb. 23, 1983, Pat. No. 4,469,613. This application Jul. 31, 1984, Ser. No. 636,227

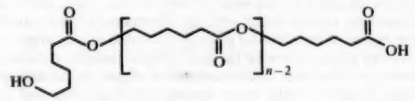
Int. Cl.[4] B01D *47/04;* **C11D** *3/48, 3/50*

U.S. Cl. 261—75 **6 Claims**

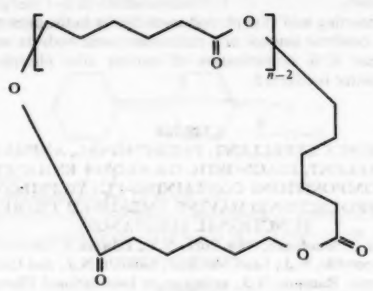


1. A hollow, totally enclosed structure comprising a thin shell totally enclosing an inner void, said thin shell having a lower base and an upper base and a side wall portion, said side wall portion connecting said upper base and said lower base in a substantially continuous fashion, said side wall being substantially impermeable to gas, said upper base being permeable to gas passing therethrough and said lower base being permeable to gas passing therethrough, and contained within at least a major portion of said void, polymeric particles which consist essentially of polymer and a functional fluid, said functional fluid being selected from the group consisting or aromatizers, deodorizers, animal repellents, pheremones, insect repellents, insect attractants, materials capable of diagnosis of physiological and/or psychological aberrations or malfunctions of mammalian species and medicinal products, said functional fluid being capable of being volatilized in the presence of an air stream passing from said lower base to said upper base through said permeable upper base and lower base in a direction substantially parallel to said outer wall, said polymeric particles being produced by means of:

(a) forming a first flowable mass of poly(epsilon caprolactone) homopolymer having the structure:



and from 0 up to minor proportion of the structure:



wherein n is an integer of from about 500 up to about 1,200 with a proviso that the average n in the system varies from about 600 up to about 800 with from about 1% up to about 30% by weight of said functional fluid;

(b) causing the flowable mass to be formed into an extruded rod using an extruder; and

(c) pelletizing the thus formed extruded rod to form pellets in the solid state;

said poly(epsilon caprolactone) homopolymer containing a stabilizer.

4,548,765

METHOD FOR DISPERSING GAS IN A SOLID-CONTAINING LIQUID, AND AN APPARATUS FOR IT

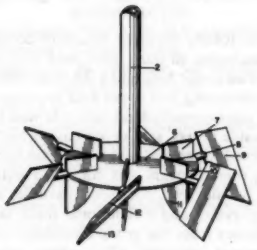
Stig-Erik Hultholm; Launo L. Lilja; Valto J. Mäkitalo, all of Pori, and Bror G. Nyman, Vanha-Ulvila, all of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Aug. 16, 1983, Ser. No. 523,725

Claims priority, application Finland, Aug. 24, 1982, 822936

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—93 **10 Claims**



1. A method for dispersing gas into small bubbles in a liquid in order to form a suspension of a gas, a liquid and a pulverous solid in the liquid and to produce a strong, suspension-maintaining flow field in a reaction chamber, comprising: introducing the gas into the bottom of a vessel, at the center, and directing the gas below the surface of a liquid which contains a pulverous solid towards the center of a horizontal, rotary, imperforate circular plate symmetrically positioned at the lower end of a rotating shaft which is suspended by its upper end, said circular plate being provided with vertical dispersing means attached to the edge of the circular plate, said vertical dispersing means being vertical dispersion blades parallel to the radius of the circular plate and located on the edges of the circular plate, whereby the gas spreads radially outwardly to form small bubbles, and a suspension of gas, liquid and solid is formed, said circular plate having attached arms and downwardly directed guiding means connected to said arms, said guiding means being baffle blades located outside the circular plate periphery and attached to the dispersion blades by arms on the plane of the circular plate, said gas being introduced by means of a gas-feeding conduit directed upwards from the reactor chamber bottom to below the circular plate at the center point of its cross-section, whereby the gas bubbles are further dispersed and said suspension is caused to change the direction of flow downwardly towards the bottom of the reaction chamber and then the direction of flow is again directed upwardly along the sides of the reaction chamber.

2. A mixer for dispersing gas into small bubbles in a liquid in order to form a suspension of gas, a liquid and pulverous solid in the liquid and to produce a strong, suspension-maintaining flow field in a reaction chamber, the mixer being located symmetrically in the lower part of the reactor and being situated at the end of a rotating shaft suspended by its upper end, above a gas-feeding conduit, comprising: at the lower end of the shaft a horizontal imperforate circular plate, symmetrical in relation to the shaft; vertical dispersion blades, parallel to the radius of the circular plate being situated on the edges of the circular plate; baffle blades outside the circular plate attached to the dispersion blades by means of arms on the plane of the circular plate; and the gas-feeding conduit situated upwards from the reactor bottom being directed to below the circular plate, to the center point of its cross section.

4,548,766

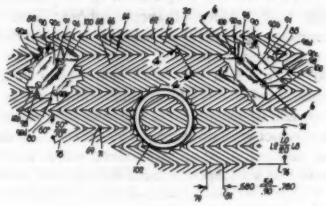
VACUUM FORMABLE WATER COOLING TOWER FILM FILL SHEET WITH INTEGRAL SPACERS

Ohler L. Kinney, Jr., Leawood, and Donald J. Lillig, Prairie Village, both of Kans., assignors to Marley Cooling Tower Company, Mission Woods, Kans.

Filed May 7, 1984, Ser. No. 607,684

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—112 **20 Claims**



1. A film fill pack for water cooling towers comprising,

a series of thin, integral, generally parallel, side-by-side spaced sheets of material adapted for film flow of water to be cooled thereover,

said sheets each being formed in a repeating chevron pattern to present a series of zig-zag, serpentine, spaced ridges on opposed faces of the sheet which define respective complementally configured zig-zag grooves between each adjacent pair of ridges,

the ridges on one face of each sheet defining the grooves on the opposite face thereof and vice versa,

said ridges each being made up of a series of end-to-end triangular sections alternately facing in opposite directions and having corresponding diverging leg segments which present a respective interior acute angle therebetween,

the ridges and thereby the grooves therebetween being of generally triangular configuration transversely thereof,

the distance from the outermost portions of one face of each formed sheet to the outermost portions of the opposed face of the respective sheet (out-to-out dimension) being in the range of about 0.18 inch to about 0.30 inch,

the lift of the zig-zag pattern, i.e. the distance from the zone of merger of two ridge leg segments facing in one direc-

tion to the next adjacent zone of merger of two ridge segments of the same ridge and facing in the same direction being from about 1 to about 2 inches,

the interior acute angle defined by diverging leg segments of each triangular ridge section of each zig-zag ridge being within the range of about 50° to about 70°,

the included angle between the surfaces of each ridge and thereby each groove transversely thereof being within the range of about 60° to about 90°, and

the center-to-center spacing between adjacent sheets being in the range of about ¼ inch to about 1 inch.

14. A film fill sheet for water cooling towers comprising,

a thin, integral, indulating sheet of material adapted for film flow of water to be cooled thereover,

said sheet being provided with a series of spaced, outwardly directed, integral sheet spacers for maintaining adjacent sheets in predetermined spaced, generally parallel relationship,

each of said spacers having inclined wall surfaces located in relative disposition causing the spacers to be generally W-shaped transversely thereof,

the outer V defining wall surfaces of the spacers extending outwardly from the plane of the ridges on one face of the sheet while the intermediate inverted V defining wall surfaces of the spacers extend outwardly beyond the plane of the opposed face of the sheet,

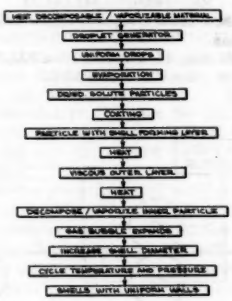
the intermediate inverted V defining wall surfaces of the spacers each being provided with spaced, inwardly directed notch means in the outer margin thereof positioned to complementally receive the outer margins of the outer V-defining wall surfaces of another of said spacers of an adjacent fill sheet.

4,548,767

METHOD TO PRODUCE LARGE, UNIFORM HOLLOW SPHERICAL SHELLS

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1983, Ser. No. 535,464
Int. Cl.⁴ B29C *6/00*
U.S. Cl. 264—7 **21 Claims**



1. A method to produce large, uniform hollow spherical shells, comprising:

producing uniform drops of a predetermined size from a solution of heat decomposable or vaporizable material;

evaporating the drops to produce dried particles of heat decomposable or vaporizable material having uniform mass;

coating the dried particles with a layer of shell forming material to produce coated particles having uniform mass;

heating the coated particles to melt the layer of shell forming material and to decompose or vaporize the dried particles of heat decomposable or vaporizable material to produce an expanding gas bubble inside the molten layer of shell forming material which causes the outer layer to expand to a spherical shell with a controlled shell diameter and thickness;

first heating the spherical shell to a temperature above its softening point after decomposing or vaporizing the heat decomposable or vaporizable material;

then cooling the spherical shell to a temperature below its softening point to cool a thinner portion of the shell wall more quickly than a thicker portion of the wall;

simultaneously with cooling the shell lowering the external pressure on the shell to a pressure lower than the internal pressure in the shell to deform the shell to a nonspherical shell with uniform wall thickness;

then increasing the external pressure on the shell to a pressure greater than the internal pressure in the shell to produce a spherical shell with uniform wall thickness; and

cooling the spherical shells.

14. A method to produce large, uniform hollow spherical shells, comprising:

producing uniform drops of a predetermined size from a solution of heat decomposable or vaporizable material;

evaporating the drops to produce dried particles of heat decomposable or vaporizable material having uniform mass;

seeding the dried particle with a metal which vaporizes or a metal compound which decomposes during the shell forming process and coats the inner shell wall;

coating the dried particles with a layer of shell forming material to produce coated particles having uniform mass;

heating the coated particles to melt the layer of shell forming material and to decompose or vaporize the dried particles of heat decomposable or vaporizable material to produce an expanding gas bubble inside the molten layer of shell forming material which causes the outer layer to expand to a spherical shell with a controlled shell diameter and thickness; and

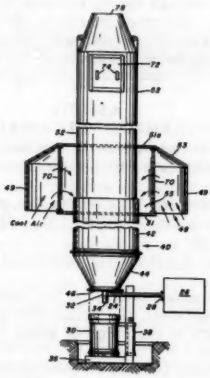
cooling the spherical shells.

4,548,768

METHOD FOR THE PRODUCTION OF ATOMIZED METAL PARTICLES

Robert A. Ramser; A. David Booz, both of New Kensington; Daniel R. Barch, Natrona Heights, and Walter S. Cebulak, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 413,514, Aug. 31, 1982, Pat. No. 4,464,103.
This application May 3, 1984, Ser. No. 595,683
Int. Cl.⁴ B29C *6/00*
U.S. Cl. 264—12 **10 Claims**



1. An improved method for safely producing pyrophoric

atomized metal in an open system comprising a containment vessel having a sidewall terminating in a bottom plate through which atomizing gas and molten metal are introduced from sources external to said vessel through nozzle means sealed to said bottom plate; the sidewall, bottom plate, and nozzle means cooperating to seal off the bottom of the vessel from an external source of molten metal adjacent thereto; and a sweeping gas ingress port in said containment vessel is spaced from the sealed off bottom portion of said vessel; the method comprising:

(a) introducing said molten metal into said vessel from said external molten metal source through said nozzle means sealed to said bottom plate in finely divided particles;

(b) introducing sweeping gas into said vessel through said gas ingress port spaced from said bottom plate and said nozzle means; and

(c) sweeping said particles from said vessel with said sweeping gas;

whereby the spacing of said sweeping gas ingress port from said bottom plate and said external source of molten metal adjacent thereto will prevent blow back of gas from said vessel into said molten metal during an inadvertent explosion of said particles within said vessel.

4,548,769

PROCESS FOR PRODUCING SEMIPERMEABLE MEMBRANE

Takatoshi Shimomura, Ibaraki; Fumio Fujita, Osaka, and Manabu Hirakawa, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 463,243, Feb. 2, 1983, Pat. No. 4,511,711.
This application Jan. 30, 1985, Ser. No. 696,483
Claims priority, application Japan, Feb. 10, 1982, 57-20316; Feb. 12, 1982, 57-21633
Int. Cl.⁴ C08J *9/36*
U.S. Cl. 264—22 **12 Claims**

1. A process for producing a semipermeable membrane which comprises dipping a semipermeable membrane of acrylonitrile polymer containing 40–100% by mole of acrylonitrile in a solution of an amine.

4,548,770

SUBJECTING FILM TO CORONA DISCHARGE PRIOR TO COMPRESSION ROLLING

Geoffrey J. Holland, San Mateo, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Nov. 17, 1983, Ser. No. 552,939
Int. Cl.⁴ B29D *7/22*
U.S. Cl. 264—22 **4 Claims**

1. In the method of compression rolling wherein a plastic film is passed through the nip of a pair of rolls, the improvement wherein a surface of the film in contact with one of the rolls is subjected to corona discharge prior to the comperssion rolling, whereby the processability of the film is improved.

4,548,771

ULTRASONIC VULCANIZATION

Nagabhusan Senapati, and Duryodhan Mangaraj, both of Dublin, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 30, 1984, Ser. No. 574,829
Int. Cl.⁴ B29H *5/01, 5/26*
U.S. Cl. 264—23 **21 Claims**

1. A method of vulcanizing rubber and like material comprising

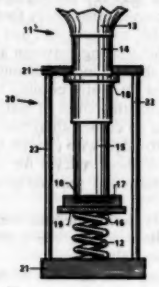
applying ultrasonic energy to the material at an energy intensity sufficient to generate heat in the material to a temperature in the range of about 200 to 300 degrees Fahrenheit,

applying a static pressure on the material sufficient to prevent substantial cavitation and material degradation therein, and

maintaining the application of the ultrasonic energy and the pressure for at least about 10 minutes for each ¼ inch in thickness of the material.

9. Apparatus for vulcanizing rubber and like material comprising

means for applying and maintaining ultrasonic energy to the



material at an energy intensity sufficient to generate heat in the material to a temperature in the range of about 200 to 300 degrees Fahrenheit, and

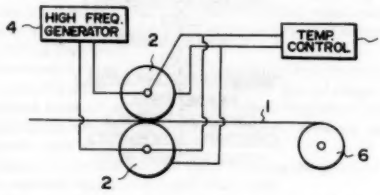
means for applying and maintaining a static pressure on the material sufficient to prevent substantial cavitation and material degradation therein.

4,548,772

SURFACE SMOOTHING METHOD FOR MAGNETIC RECORDING MEDIUM

Toshio Kawamata, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 11, 1983, Ser. No. 522,221
Int. Cl.⁴ B29C *17/00*
U.S. Cl. 264—26 **5 Claims**

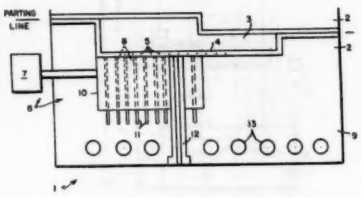


1. A method of smoothing the surface of a flexible magnetic recording medium comprising a magnetic layer of a magnetic material and a dielectric resin binder by passing the magnetic recording medium between at least one set of two rolls at least one of which is a metal roll, wherein the improvement comprises using said rolls as electrodes of a high-frequency dielectric heater, feeding a refrigerant to said rolls to cool said rolls to a substantially constant temperature, applying a high frequency to said electrodes, and pressing said medium between said rolls, thereby continuously smoothing the surface of said medium.

4,548,773
INJECTION MOLDING METHOD

Nam P. Suh, Sudbury, and James R. Rinderle, Watertown, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 152,493, May 22, 1980, Pat. No. 4,338,068.
This application Jun. 9, 1982, Ser. No. 386,618
Int. Cl.⁴ B29F *1/00*
U.S. Cl. 264—40.6 2 Claims



1. A process for making injected molded parts during a molding cycle comprising the steps of

injecting molding material into an injection mold cavity;

controllably heating at least a portion of the mold cavity surface of said mold during the injection of said molding material to maintain the temperature of said injected material at a sufficient level to prevent the molecules of said injected material from solidifying into a specific orientation;

cooling at least a portion of said mold cavity surface;

controlling the rate of cooling of at least one portion of the mold cavity surface of said mold independently from at least one other portion of the mold cavity surface of said mold so as to maintain the temperature of said injected material substantially the same throughout all portions of said mold cavity during the cooling portion of the molding cycle to prevent secondary flow of said injected material between portions of said mold cavity; and

ejecting the part from the mold.

4,548,774
METHOD FOR PREPARING A SIC WHISKER-REINFORCED COMPOSITE MATERIAL

Masaru Akiyama, Ibaraki; Jotaro Yamada, Nagoya, and Masaya Takahata, Fujisawa, all of Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,134
Claims priority, application Japan, Jul. 28, 1982, 57-130293
Int. Cl.⁴ B22D *19/14;* B29G *1/00*
U.S. Cl. 264—44 7 Claims

1. A method for preparing a SiC whisker-reinforced composite material, comprising the steps of:

preparing the fibrous base of a SiC whisker sponge-like cake by mixing a silica gel or ashed rice hulls, said silica gel or ashed rice hulls being a silicon source and containing 6.0 to 25.0% by weight of a water-soluble compound selected from the group consisting of Fe, Ni and Co, based on the Si content, with a furnace carbon black having an aggregated structure and a DBP absorption number of 50 ml/100 g or more as a carbonaceous material and with an additional amount of NaCl as a space forming agent,

lightly packing the resultant mixture in a sealed reaction vessel,

heating the mixture to a temperature of 1,300° to 1,700° C. in a nonoxidizing atmosphere, and

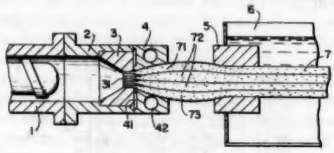
burning away the residual carbonaceous material to obtain said fibrous base of said cake; and

introducing a matrix material selected from the group consisting of a metal, an alloy and a plastic into the fibrous base of the SiC whisker sponge-like cake.

4,548,775
METHOD FOR PRODUCTION OF THERMOPLASTIC RESIN FOAMS

Motoshige Hayashi, and Toshiro Kobayashi, both of Nara, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jan. 5, 1984, Ser. No. 568,545
Int. Cl.⁴ B29D *27/00*
U.S. Cl. 264—45.5 8 Claims

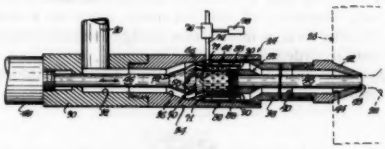


1. A method for producing a thermoplastic resin foam which comprises extruding an expandable resin through a plurality of holes bored in a die which is provided with a frame in an adjacent relation with the extrusion end surface thereof, said frame being adapted to surround the holes, and fusing together the extruded materials from the holes while they are expanded and still softened, wherein the inner surfaces of the frame are inclined so that its cross-sectional area is increased toward the outer end thereof, the angle of inclination of the inner surface to a straight line vertical to the extrusion end surface is maintained within the range of from 5° to 30°, the temperature of the inner surface is maintained lower than the softening temperature of the expandable resin, and the extruded materials are fused together while kept in contact with the inner surfaces of the frame.

4,548,776
METHOD AND APPARATUS FOR MOLDING STRUCTURAL FOAM ARTICLES

Ernest C. Holdredge, Jr., Warrenville, Ill., assignor to Techplastics, Inc., West Chicago, Ill.

Filed Nov. 23, 1983, Ser. No. 554,761
Int. Cl.⁴ B29D *27/00*
U.S. Cl. 264—50 30 Claims



1. A method of molding flowable plastic material in mold means defining a mold cavity, comprising the steps of:

providing a source of said flowable plastic material;

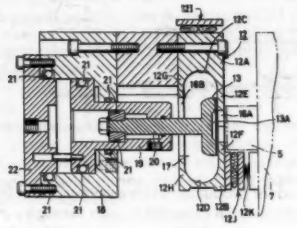
cyclically driving a quantity of said flowable plastic material received from said source into said mold means; and

mixing said plastic material with a blowing agent as the material is driven into said mold means by driving said plastic material through mixing means disposed upstream of said mold means wherein said mixing means includes movable blade means disposed in the path of flow of said plastic material through said mixing means so that said cyclicly driven plastic material acts against and drives said movable blade means for movement for mixing at least a portion of the plastic material as it flows through said mixing means.

4,548,777
METHOD OF MANUFACTURING INFORMATION STORAGE MEDIUMS

Tomeichiro Fukuda, Yokohama; Takashi Soda, Tokyo; Ikuo Furukawa; Takushi Hayashi, both of Sagamihara; Fujio Kumata, Tokyo, and Susumu Nagano, Yokosuka, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Apr. 9, 1982, Ser. No. 367,225
Claims priority, application Japan, Apr. 10, 1981, 56-54168
Int. Cl.[4] B29D *17/00*
U.S. Cl. 264—107 **8 Claims**



1. A method of manufacturing information storage medium blanks, comprising the steps of:

(a) extruding a mass of electrically conductive synthetic resin through a nozzle;

(b) molding the extruded mass into a cake in a molding means having a moldable plate mounted on a piston rod of a piston and cylinder assembly, the plate having a surface confronting the nozzle and having a central recess in said surface, the molding step including catching a tip of the extruded mass in said recess and allowing said plate to be retracted away from said nozzle by the extruded mass being discharged from said nozzle with the piston rod slidably moved into a cylinder of said piston and cylinder assembly, while permitting the extruded mass to be expanded radially outwardly with said tip centrally contained in a core portion of said cake;

(c) carrying said cake from said molding means;

(d) pressing said cake in a press into an information storage medium blank including a recorded region and an overflow;

(e) transferring said information storage medium blank from said press;

(f) trimming said information storage medium blank to cut said overflow off said recorded region as a scrap, to thereby form an information storage medium composed of said recorded region; and

(g) punching out said core portion from said information storage medium.

4,548,778
METHOD OF PRODUCING THERMOPLASTIC RESIN SHEET OR FILM

Atsushi Fujii, Sodegaura, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

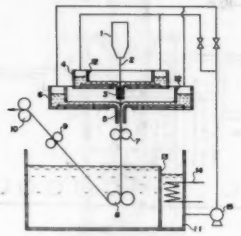
Filed Sep. 26, 1983, Ser. No. 535,661
Int. Cl.[4] B29F *3/08*
U.S. Cl. 264—180 **17 Claims**

1. A method of producing a thermoplastic sheet or film, comprising:

extruding a molten thermoplastic resin through a T-die to form an extruded sheet or film;

passing said extruded sheet or film through a first stationary slit in which a cooling water is flowing, such that said sheet or film is contacted with cooling water in said first slit, said cooling water flowing in cocurrent substantially nonturbulent, laminar flow with said sheet or film to cool said sheet or film, and exiting said cooled sheet or film from said first slit; and

then passing said exited cooled sheet or film through at least a second stationary slit in which a cooling water is flowing, said second slit being below and spaced from said first slit such that said sheet or film is contacted with cooling water in said second slit, said cooling water flowing in



cocurrent, substantially non-turbulent, laminar flow with said sheet or film to further cool said sheet or film, and

then exiting said further cooled sheet or film from said second slit;

the flow rate of cooling water through said slits being at least equal to the running speed of said sheet or film through said slits.

4,548,779
ROTATIONAL MOLDING MULTILAYERED ARTICLES

Albert H. Steinberg, Morris Plains; Frank Petruccelli, Boonton; Mariann E. Lucas, Budd Lake, and Lev Zlatkevich, South Orange, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 15, 1982, Ser. No. 441,811
Int. Cl.[4] B29C *5/04*
U.S. Cl. 264—255 **12 Claims**

1. A method of rotationally molding an article having at least two layers, an outer layer made of a polyamide composition comprising a polyamide and a copolymer comprising units derived from an alpha-olefin of the formula $RCH{=}CH_2$ wherein R is H or an alkyl having from 1 to 8 carbon atoms and from 0.2 to 25 mold percent based on the copolymer of an alpha,beta-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms, the copolymer having 10% to 100% of the carboxylic acid groups neutralized by metal ions, and an inner layer made of a polyolefin, wherein the inner layer is a polyolefin suitable for rotational molding, the outer polyamide composition layer having a higher melting point temperature than the inner layer, comprising the steps of:

feeding the polyamide composition into the cavity of a rotational mold;

rotationally molding the polyamide composition to form the outer layer;

cooling the polyamide layer to below the polyamide composition melting temperature but to above the melting temperature of the polyolefin;

feeding the polyolefin into the cavity of the rotational mold; and

rotationally molding the polyolefin to form the inner layer adjacent to the inner surface of the solidified outer polyamide composition layer.

4,548,780

SENSING DEVICES FOR MOUNTING IN CHAMBER WALLS AND A METHOD OF MANUFACTURE

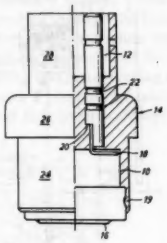
Rasmus A. R. Krohn, Morpeth, England, assignor to Elmwood Sensors Limited, Tyne and Wear, England

Filed Jan. 22, 1982, Ser. No. 341,958

Claims priority, application United Kingdom, Jan. 27, 1981, 8102409

Int. Cl.[4] B29C 6/00; G01K 7/16

U.S. Cl. 264—272.15 12 Claims



1. A method of forming a sensing device which is receivable in an aperture in a wall of a chamber of an internal combustion engine, comprising the steps of forming a subassembly by positioning in a common plastics jig at least one terminal and a sensor element having at least one contact surface thereon and making electrical connection between the or each terminal and the respective contact surface of the sensor element; and integrally moulding a body made of a plastic material around said subassembly including the plastics jig to provide a rugged durable attachment of said at least one terminal to said sensor element, and a durable sealed electrical interconnection of said at least one terminal to said sensor element, said body being formed and configured to be received in said aperture so that said sensor element is in communication with the interior of said chamber for sensing a parameter therein and so that the or each terminal is exposed for electrical connection to circuitry external to said chamber.

4,548,781

METHOD OF LOADING GREEN TIRES

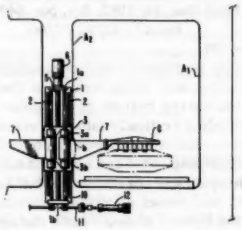
Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 512,129

Claims priority, application Japan, Jul. 23, 1982, 57-128363; Jul. 28, 1982, 57-131860

Int. Cl.[4] B29H 5/02

U.S. Cl. 264—315 7 Claims



1. A method for loading green tires into a curing press having first and second laterally aligned chambers for curing respective green tires therein, and having a center portion therebetween, each chamber being defined by an upper mold having an upper bead ring and a lower mold, at least one of the upper and lower molds being reciprocally vertically movable with respect to the other to open and close the chambers, the method comprising the steps of:

(a) providing a green tire loading mechanism in front of the center portion of the press, the loading mechanism including first and second movable green tire loading devices having upwardly directed gripping claws, for respectively loading first and second green tires into the first and second chambers;

(b) providing a green tire placing table which is angularly movable 180° about a horizontal axis, at a center position in front of the center portion of the tire curing press;

(c) moving a first green tire having first and second opposite annular bead portions onto the table with the first bead portion down, at the center position;

(d) locating the first green tire on the gripping claws of the first loading device at a first standby position in front of the first chamber with the second bead portion down, said first green tire locating step including the steps of

(1) moving the first green tire from the center position to the first standby position on one of the table and the gripping claws of the first loading device, and

(2) moving the first green tire from the table onto the gripping claws of the first loading device with the second bead portion down;

(e) moving a second green tire having third and fourth bead portions onto the table with the third bead portion down, at the center position;

(f) locating the second green tire on the gripping claws of the second loading device at a second standby position in front of the second chamber with the fourth bead portion down, said second green tire locating step including the steps of

(1) moving the second green tire from the center position to the second standby position on one of the table and the gripping claws of the second loading device, and

(2) moving the second green tire from the table onto the gripping claws of the second loading device with the fourth head portion down;

said steps of moving the first tire and moving the second tire including the respective steps of inverting the first tire by inverting the table with the first tire thereon and inverting the second tire by inverting the table with the second tire thereon; and

(g) moving the first and second loading devices with the first and second tires on the gripping claws thereof and the respective second and fourth bead portions being down, from the first and second standby positions respectively to the first and second chambers.

4,548,782

TOKAMAK PLASMA HEATING WITH INTENSE, PULSED ION BEAMS

Wallace M. Manheimer, Silver Spring, Md., and Niels K. Winsor, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1980, Ser. No. 134,717

Int. Cl.[4] G21B 1/00

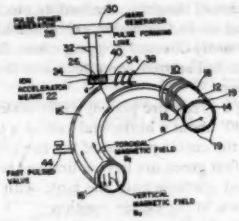
U.S. Cl. 376—127 8 Claims

1. Apparatus for heating a plasma, the plasma being confined in an apparatus of the type wherein the plasma is confined in a vacuum chamber by a magnetic field, comprising:

means for producing a space-charge-neutralized, pulsed, ion beam;

means for directing the ion beam into the magnetic field before the plasma is fully formed; and

means for forming the remainder of the plasma around the beam,



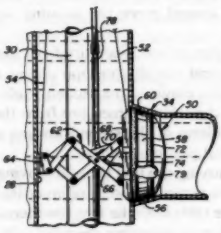
the beam transferring its energy to the plasma by classical collisions with the electrons and ions of the plasma.

4,548,783

OUTLET PLUG FOR RECIRCULATION LOOP OF NUCLEAR REACTOR

Charles A. Dalke, and Bradley G. Stoll, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 10, 1982, Ser. No. 356,903
Int. Cl.[4] G21C *19/04, 19/20*
U.S. Cl. 376—204 **4 Claims**



1. For use in a cooling fluid filled cylindrical nuclear reactor pressure vessel to isolate a cooling fluid recirculation loop, said vessel containing a cylindrical fuel core shroud spaced from the sidewall of said vessel, said vessel having an outlet nozzle in the sidewall of said vessel adjacent said shroud coupled to an outlet conduit of said loop, said nozzle having a beveled seat formed in its inner end, compact collapsible plug apparatus for blocking said nozzle comprising:

a plug having a tapered face portion generally mating with said beveled seat of said nozzle;

gasket means mounted to said tapered face portion of said plug for sealing said plug to said beveled seat of said nozzle upon abutment between said face portion and said seat;

maneuvering means attached to said plug for remotely positioning said plug in confronting relationship with said nozzle, said plug being maneuvered by said maneuvering means downward through the space between said shroud and said sidewall of said vessel to said confronting relationship; and

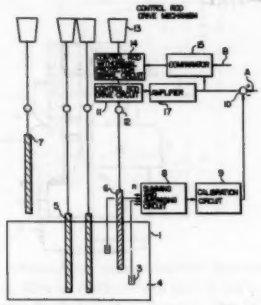
jack means attached to said plug, said jack means including an extendable scissor assembly, said scissor assembly being remotely selectively extendable to bear against said shroud for providing a force between said shroud and said plug for urging and maintaining said tapered face portion of said plug in abutment with said beveled seat of said nozzle.

4,548,784

NUCLEAR REACTOR POWER CONTROL SYSTEM

Yoshio Wateri, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,586
Claims priority, application Japan, Aug. 22, 1980, 55-114800
Int. Cl.[4] G21C *7/00*
U.S. Cl. 376—216 **8 Claims**



1. A nuclear reactor power control system comprising:

a plurality of fuel rods;

a control rod for flattening a fuel power distribution;

a control rod for controlling a power level;

a safety rod for reducing the power in case of emergency;

a plurality of neutron detectors for detecting the power;

a sampling adjuster for receiving power signals from said neutron detectors and comparing them with a preset power level signal to produce a difference signal therebetween;

control rod drive means responsive to the difference signal from said sampling adjuster to drive said control rods for controlling the power level;

means for detecting the drop of said control rod for flattening the fuel power distribution or said safety rod for reducing the power in case of emergency; and

means responsive to the detection of the drop to stop the drive by said control rod drive means for controlling the power level.

4,548,785

STUB TUBE INSPECTION DEVICE

David L. Richardson, Los Gatos; Peter M. Patterson, Livermore; Jack P. Clark, San Jose; Scott R. Stanton, San Jose, and Richard W. Perry, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 14, 1982, Ser. No. 449,651
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—249 **9 Claims**

1. A remotely positionable and controllable inspection device for inspecting stub tubes welded at their lower ends in apertures in the curved bottom of a nuclear reactor pressure vessel and extending vertically into said vessel, said stub tubes being adapted to receive therethrough control rod drive housing tubes, said housing tubes and said stub tubes being welded together at the upper ends of said stub tubes, said housing tubes extending into said vessel a varying amount because of the curvature of the bottom of said vessel, the upper ends of said housing tubes being in a common lateral plane, control rod guide tubes supported on said housing tubes and extending upward through holes in a laterally extending lower core plate in said vessel, fuel assembly support members supported on said guide tubes, a plurality of fuel assemblies supported by each said support member, the upper ends of said fuel assemblies extending into an opening in an upper core grid for lateral support, said fuel assemblies and the associated support mem-

ber and guide tube being removable from said vessel to provide access of said inspection device to the stub tube to be inspected, said inspection device comprising: a central shaft; an elongated, downward extending cage member secured to the lower end of said central shaft, said cage member having an inside diameter sized to slip over the housing tube extending through said stub tube, the lower end of said cage member bearing upon the top end of said stub tube for engaging and locating said inspection device on said stub tube with said central shaft in axial alignment with said stub tube; an elongated upward extension member secured to the upper end of said central shaft and extending through the hole in said lower core plate vacated by removal of said guide tube, said extension member having means at its upper end for connection to handling apparatus for lifting and maneuvering said inspection device and being fitted with a plurality of laterally extending members for engaging said hole to provide upper lateral support of said inspection device to maintain said inspection device in axial alignment with said stub tube: a carriage journalled for rotation on said central shaft; a vertically oriented instrument shaft supported on said carriage and journalled for reciprocation, said instrument shaft extending downward alongside said cage member with its lower end in the vicinity of said stub tube; an inspection instrument secured to the lower end of said instrument shaft and positioned adjacent said stub tube; remotely controllable instrument shaft drive means mounted on said carriage and coupled to said instrument shaft for selectably moving said inspection instrument downward and upward through a scanning stroke along a vertical path on said stub tube and remotely controllable carriage drive means mounted on said carriage and coupled to said central shaft for incrementally rotating said carriage between scanning strokes whereby a succession of spaced vertical paths on said stub tube can be scanned.

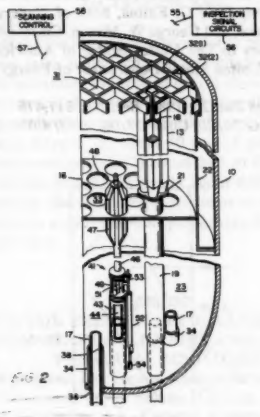


FIG 2

4,548,786

COATED CARBIDE CUTTING TOOL INSERT

Warren C. Yohe, Mt. Clemens, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Apr. 28, 1983, Ser. No. 489,286

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

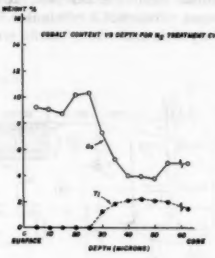
Int. Cl.⁴ B22F *3/12;* **C22C** *29/00*

U.S. Cl. 419—29 **6 Claims**

1. A process for providing a cobalt cemented carbide article with a cobalt-enriched zone comprising, in sequence;

(a) heating a compressed composite mixture consisting essentially of tungsten carbide, cobalt and B-1 solid solution phase forming, carbide constituents in a furnace to provide a composite heated below the sintering temperature;

(b) contacting said composite heated at a temperature in the range of 1200° C. to 1500° C. with nitrogen gas to nitride the B-1 phase; and



(c) subjecting the composite having the nitrided B-1 phase to vacuum while the composite is heated at an elevated temperature below or about the sintering temperature to produce a cobalt-enriched surface zone.

4,548,787

AQUEOUS LIQUIDS CONTAINING METAL CAVITATION-EROSION CORROSION INHIBITORS

Joe C. Wilson, Woodhaven; Stanley T. Hirozawa, Birmingham, and John J. Conville, Canton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 315,319, Oct. 26, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,193

Int. Cl.⁴ C23F *11/16, 11/18;* **C02F** *5/10*

U.S. Cl. 422—15 **18 Claims**

12. A process for inhibiting mineral scale and corrosion of metal in the presence of aqueous liquids and especially for inhibiting cavitation-erosion corrosion of aluminum comprising adding to said aqueous liquid the following parts based upon 100 parts by weight of said aqueous liquid from about:

(A) 0.5 to 2 parts by weight of a water-soluble hydrogen phosphate,

(B) 0.001 to 0.50 parts by weight of a water-soluble molybdate, tungstate, or selenate, and

(C) a 0.1 part to 0.8 parts by weight of a siloxane-silicate copolymer.

4,548,788

APPARATUS FOR PRODUCING STYRENIC/ALKENYLNITRILE COPOLYMERS

Jeffrey D. Morris, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 423,488, Sep. 24, 1982, abandoned. This application Sep. 21, 1983, Ser. No. 534,424

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.⁴ C08F *220/44;* **G05D** *23/00*

U.S. Cl. 422—109 **22 Claims**

1. An apparatus for the continuous mass polymerization of styrenic and alkenylnitrile monomers to produce a styrenic-/alkenylnitrile copolymer, comprising:

a reaction vessel;

means for continuously introducing a feed comprising a predetermined ratio of styrenic and alkenylnitrile monomers into said reaction vessel to produce a reaction mixture;

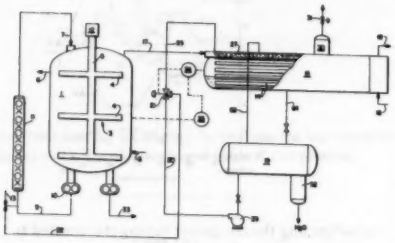
means for subjecting the reaction mixture containing styrenic and alkenylnitrile monomers to conditions of temperature and pressure under which said monomers copolymerize to produce a styrenic/alkenylnitrile copolymer;

means for subjecting the reaction mixture to agitation sufficient to maintain a substantially uniform composition

distribution and a substantially uniform temperature distribution throughout the reaction mixture;

means for continuously withdrawing styrenic/alkenylnitrile copolymer from the reaction vessel; and

means for cooling the reaction mixture by withdrawing a vapor phase containing vaporized styrenic and alkenylnitrile monomer from the reaction vessel, wherein said cooling means comprises a condenser for condensing the vaporized styrenic and alkenylnitrile withdrawn from the



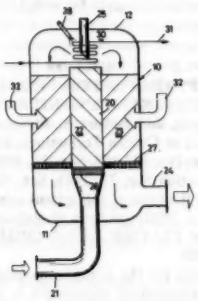
reaction vessel to produce a condensed monomer-containing liquid, means for returning the condensed monomer-containing liquid to the reaction vessel, and means for controlling the amount of vaporized monomers withdrawn from the reaction vessel by including in the condenser, means for selectively varying the amount of cooled surface area available for contact with the withdrawn vaporized monomers in response to the temperature in the reaction vessel, whereby the amount of vaporized monomers condensing is controlled.

4,548,789

MONO-STAGE DEVICE TO GENERATE GASEOUS SO_3 FROM MELTED SULPHUR

Mario Ballestra, Milan, Italy, assignor to Ballestra S.p.A., Milan, Italy

Filed Aug. 23, 1983, Ser. No. 525,788
Claims priority, application Italy, Sep. 6, 1982, 12617 A/82
Int. Cl.⁴ F01C *1/00*
U.S. Cl. 422—160 **8 Claims**



1. A mono-stage device for generating gaseous sulphuric anhydride from melted sulphur comprising,

a first chamber containing filling material providing a large surface area, means for introducing melted sulphur into an upper end of said first chamber to flow down over said filling material, means for introducing air into a lower end of said first chamber, means for initially igniting said sulphur, whereupon said sulphur is burned to produce combustion products comprising sulphur dioxide,

a second chamber contiguous with said first chamber and containing catalytic material providing a large surface area, means for connecting the upper end of said second chamber with the upper end of said first chamber for flow of said combustion products from said first chamber into said second chamber and down through said catalytic material in said second chamber for conversion of sulphur dioxide into sulphuric anhydride, and means for discharging conversion products comprising sulphuric anhydride from a lower end of said second chamber,

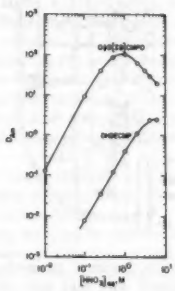
said first and second chambers having a common heat-conducting wall for thermal transfer between said chambers.

4,548,790

METHOD FOR EXTRACTING LANTHANIDES AND ACTINIDES FROM ACID SOLUTIONS

E. Philip Horwitz; Dale G. Kalina, both of Naperville; Louis Kaplan, Lombard, and George W. Mason, Clarendon Hills, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

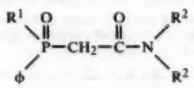
Filed Jul. 26, 1983, Ser. No. 517,475
Int. Cl.⁴ C01G *56/00*; **C01F** *17/00, 9/53*; **C07C** *103/00*
U.S. Cl. 423—9 **15 Claims**



1. A process for the recovery of multivalent lanthanide and actinide values from an aqueous acid solution containing these and other values comprising:

adjusting the molarity of the acid in the aqueous solution to between 0.1 and 12.0M to form a feed solution;

contacting the feed solution with an extraction solution consisting of an organic extractant in an inert water-immiscible organic diluent, the extractant having the formula:

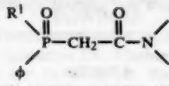


where ϕ is phenyl, R′ is a straight or branched alkyl containing from 6 to 12 carbon atoms and R^2 is an alkyl containing from 3 to 6 carbon atoms, whereby the multivalent lanthanide and actinide values are selectively extracted from the feed solution, thereby loading the extraction solution,

separating the loaded extraction solution from the feed solution, and

stripping the lanthanide and actinide values from the extraction solution, thereby recovering the lanthanide and actinide values.

13. A compound having the structural formula:



where ϕ is phenyl, R^1 is a straight or branched alkyl containing from 6 to 12 carbon atoms and R^2 is an alkyl containing from 3 to 6 carbon atoms.

4,548,791

THALLIUM-CONTAINING COMPOSITION FOR STRIPPING PALLADIUM

Augustus Fletcher, Bristol, and William L. Moriarty, South Meriden, both of Conn., assignors to American Chemical & Refining Company, Inc., Waterbury, Conn.

Filed Sep. 30, 1983, Ser. No. 537,945
Int. Cl.⁴ C23F *3/04*
U.S. Cl. 423—22 **15 Claims**

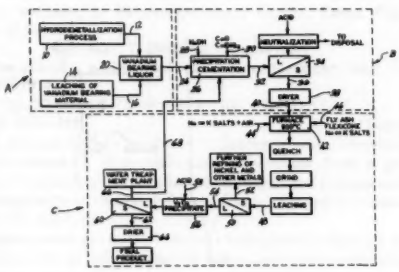
1. A composition for addition to water to produce a solution for stripping gold, palladium, and palladium/nickel alloy deposits from substrates, comprised of: (1) about 8 to 30 parts of a nitrobenzoic acid derivative selected from the group consisting of chloronitrobenzoic acids, alkali metal nitrobenzoates, and mixtures thereof; (2) about 40 to 135 parts of a cyanide radical source compound; (3) about 0.03 to 0.1 part of a thallium compound; and (4) optionally about 0.08 to 0.3 part of a lead compound, the foregoing ingredients of said composition being soluble in water, and said parts thereof being expressed on a weight basis.

4,548,792

METHOD FOR PRECIPITATING VANADIUM FROM VANADIUM BEARING LIQUORS AND RECOVERING VANADIUM PENTOXIDE

Domingo Rodriguez, Los Teques; Roberto Schemel, San Antonio de Los Altos, and Ramon Salazar, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Mar. 15, 1984, Ser. No. 589,949
Int. Cl.⁴ C01G *31/00, 53/04*
U.S. Cl. 423—65 **17 Claims**



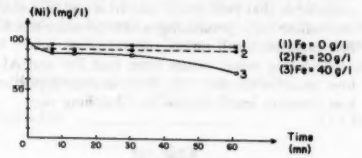
1. A process for precipitating vanadium and nickel from vanadium-nickel bearing liquors comprising the steps of providing a pregnant liquor containing vanadium and nickel; adjusting the pH of said pregnant liquor with a precipitating agent to a pH in the range of from about 5.5 to 6.5 so as to precipitate vanadium in its trivalent and tetravalent states wherein said precipitating agent is a material selected from the group consisting of hydroxides of sodium, potassium, calcium and mixtures thereof; and further adjusting the pregnant liquor with said precipitating agent to a pH in the range of from about 8.5 to 9.5 so as to precipitate nickel oxide.

4,548,793

ELECTROCHEMICAL ELIMINATION OF NICKEL FROM LEAD CONTAINING CHLORIDE SOLUTIONS

Didier Beutier; Hugues Bruvier, both of Paris, and Claude Palvadeau, Breuillet, all of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Filed Jan. 14, 1983, Ser. No. 458,148
Int. Cl.⁴ C22B *3/00*
U.S. Cl. 423—92 **3 Claims**



1. A process for removing nickel from lead chloride dissolved in a chloride brine to obtain a lead chloride solution wherein the nickel concentration is under 50 mg/liter which comprises:

(a) adjusting the content of an element selected from the group consisting of arsenic and antimony to a value of at least 1/5 of the concentration of nickel expressed in grams per liter;

(b) adjusting the concentration of copper to a value of at least 1/5 of the concentration of nickel expressed in grams per liter; and

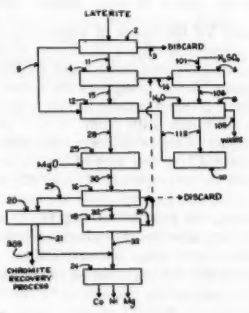
(c) contacting the solution from (b) with lead powder thus precipitating nickel and the said element selected from the group consisting of arsenic and antimony.

4,548,794

METHOD OF RECOVERING NICKEL FROM LATERITE ORES

E. Harris Lowenhaupt, Gasquet, Calif.; John E. Litz, Lakewood, and Dennis L. Howe, Broomfield, both of Colo., assignors to California Nickel Corporation, Crescent City, Calif.

Filed Jul. 22, 1983, Ser. No. 516,236
The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.
Int. Cl.⁴ C01G *53/00, 55/00;* C22B *3/00*
U.S. Cl. 423—123 **21 Claims**



1. A method of recovering metal values from iron-, aluminum-, magnesium-, nickel- and cobalt-containing laterite ore comprising:

(a) separating said ore into at least a first and second fraction, said second fraction containing more of said magnesium than said first fraction;

(b) contacting said first fraction with sulfuric acid in a high

pressure leach at elevated temperature and pressure sufficient to solubilize nickel and cobalt to form a solubilized nickel- and cobalt-containing high pressure leachate and a high pressure leach residue;

(c) separating said high pressure leach residue from said high pressure leachate;

(d) contacting at least a portion of said separated high pressure leachate, and at least a portion of said second fraction of step (a) in a low pressure leach at a pressure above atmospheric and below about 300 psig and at temperature conditions that precipitate said iron and said aluminum in crystalline form producing a low pressure leachate and a low pressure leach residue; and

(e) recovering metal values from said Fe- and Al-depleted low pressure leachate and from at least a portion of said low pressure leach residue in a leaching step.

4,548,795

TREATMENT OF ALUMINOUS MATERIALS

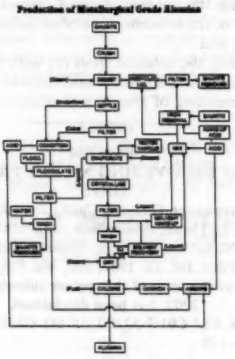
William H. Andrews, Mt. Waverly; David J. Milne, North Balwyn; Ronald W. Moyle, Templestowe, and James P. Peters, Surrey Hills, all of Australia, assignors to Comalco Aluminum Limited, Australia

Division of Ser. No. 370,035, Apr. 20, 1982, Pat. No. 4,474,736. This application May 10, 1984, Ser. No. 608,806

Claims priority, application Australia, Apr. 29, 1981, PE8629

Int. Cl.[4] C01F *7/22*

U.S. Cl. 423—126 **4 Claims**



1. Process for treatment of aluminous material containing iron and where the object aluminous mineral is gibbsite, to reduce the iron content thereof and to produce metallurgical grade alumina, which comprises the steps:-

(a) reacting crushed bauxite having a maximum particle size of about 1 mm with from 22 to 7 parts of an aqueous aluminium chloride solution containing up to 30 weight percent $AlCl_3$ to one part of bauxite by weight, at a temperature in the range 120° C.–240° C., whereby aluminium hydroxide and iron minerals are extracted;

(b) filtering the product of step (a) to separate a solution containing aluminium hydroxychlorides from a gangue material which latter is discarded;

(c) evaporating and crystallising the solution from step (b) to produce crystalline aluminium hydroxychlorides;

(d) filtering the product of step (c) to separate a solution containing unreacted aluminium chloride and uncrystallised aluminium hydroxychlorides, from crystalline aluminium hydroxychlorides;

(e) washing the crystalline aluminium hydroxychlorides from step (d) with a water miscible liquid in which the crystalline aluminium hydroxychlorides are insoluble or soluble only to a limited extent, to remove salts of iron and other contaminating materials; and

(f) calcining the crystalline product from step (e) at a temperature in the range 800° to 1100° C. to produce metallurgical grade alumina and gaseous hydrochloric acid.

4,548,796

PROCESS FOR THE PRODUCTION OF PURE BURNT LIME

Peter Weber, Saal a.d. Donau, Fed. Rep. of Germany, assignor to SKW Trostberg A.G., Trostberg, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,447

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226851

Int. Cl.[4] C01F *11/06*

U.S. Cl. 423—175 **30 Claims**

1. A process for producing pure burnt lime from limestone which comprises:

a. gasifying industrial waste energy carriers in an installation consisting of a fluidized bed and a cyclone, by thermal decomposition of said industrial waste energy carriers at temperatures between 650° C. and 800° C. so as to produce industrial waster gaseous fuels and so as to release noxious substances during said gasifying;

b. separating off said noxious substances from said industrial waste gaseous fuels before coming into contact with the limestone to be burnt, said separating off being performed by means of an adsorbent; and,

c. burning said limestone with said industrial waste gaseous fuels produced from the gasification of said industrial waste energy carriers, the burning of said limestone being in the absence of fossil fuels.

4,548,797

PROCESS OF REMOVING POLLUTANTS FROM EXHAUST GASES

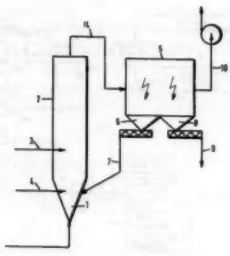
Harald Sauer; Hans-Werner Schmidt, both of Frankfurt am Main, and Wolfgang Fennemann, Karben, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,839

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235558

Int. Cl.[4] C01B *7/00;* **B01D** *31/02*

U.S. Cl. 423—240 **12 Claims**



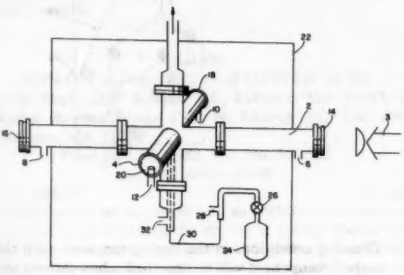
1. A process for removal of pollutants of the group consisting of SO_x, HCl, HF and H_2S from an exhaust gas by means of solids circulating in a circulating system formed by a fluidized bed reactor, a separator and a return line comprising introducing the polluted exhaust gas into said fluidized bed reactor to fluidize the bed therein, said bed consisting of two solid fractions, the first fraction having a particle size d_p 50 in the range of 150 to 500 microns and the second fraction having a particle size d_p 50 below 10 microns, collecting solids entrained by the gas in separate particle size fractions and returning at least the coarser solid fraction into said fluidized bed reactor.

4,548,798

LASER SYNTHESIS OF REFRACTORY OXIDE POWDERS

Gary W. Rice, Whitehouse Station, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 16, 1984, Ser. No. 601,079
Int. Cl.[4] C01B *33/18, 35/10;* C01F *17/00;* C01G *23/047*
U.S. Cl. 423—263 11 Claims



1. A continuous process for producing refractory oxide powders comprising:

(a) obtaining a boron, silicon or metal containing compound including organic components in a gaseous state below its decomposition temperature such that the organic components are bound to the boron, silicon or metal by one or more boron, silicon or metal oxygen bonds,

(b) irradiating said compound in the substantial absence of elemental oxygen with a laser such that the energy is absorbed in a vibrational mode at such an intensity so as to cause pyrolytic decomposition in a continuous manner, in the substantial absence of exothermic chemistry, so as to produce a refractory oxide powder, and

(c) collecting said refractory oxide powder.

4,548,799

PROCESS FOR RECOVERING NITROGEN FROM OXYGEN-CONTAINING GAS MIXTURES

Karl Knoblauch, Essen; Heinz Heimbach, Essen-Heidhausen, and Burkhard Harder, Oberhausen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,241
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1983, 3307974
Int. Cl.[4] C01B *21/00;* B01J *8/00, ;* B01D *51/00*
U.S. Cl. 423—351 3 Claims

1. A process for the recovery of nitrogen with a residual oxygen content of 10 to 1000 parts per million from a gas mixture consisting predominantly of nitrogen and oxygen and containing both in substantial proportions, said process comprising the steps of:

(a) passing said gas mixture under a high pressure through an active one of two alternately active adsorbers containing carbonaceous molecular sieve adsorption beds during a separation phase half-cycle while discharging high purity nitrogen as a product gas from said one of said adsorbers;

(b) concurrently with step (a) evacuating the other of said adsorbers to desorb the same;

(c) thereafter interconnecting said adsorbers on both sides of said beds for a limited period of 0.3 to 0.7 second to permit limited pressure transfer therebetween only for the duration of said limited period;

(d) thereafter building up pressure in said other adsorber to said high pressure and commencing evacuation of said one adsorber; and

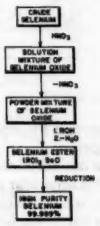
(e) repeating steps (a) through (d) with cyclical alternation of said adsorbers as said one adsorber and said other adsorber with each repetition.

4,548,800

PROCESS FOR SELENIUM PURIFICATION

Santokh S. Badesha, Ontario, and Thomas W. Smith, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1982, Ser. No. 404,259
Int. Cl.[4] C01B *19/02*
U.S. Cl. 423—510 17 Claims



1. A process for the preparation of selenium of high purity which comprises reacting selenious acid, selenium oxides, or mixtures thereof, with an alcohol, and subjecting the resulting selenium ester, subsequent to purification to a reduction reaction.

4,548,801

PLATE-LIKE BARIUM FERRITE PARTICLES FOR USE IN MAGNETIC RECORDING AND PROCESS FOR PRODUCING THE SAME

Norimichi Nagai; Nanao Horiishi, both of Hiroshima; Masao Kiyama, and Toshio Takada, both of Kyoto, all of Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Feb. 2, 1984, Ser. No. 576,147
Claims priority, application Japan, Feb. 5, 1983, 58-17792
Int. Cl.[4] C01G *49/00;* C04B *35/26*
U.S. Cl. 423—594 11 Claims

1. Plate-like barium ferrite particles of the formula $BaO.6Fe_2O_3$ for use in magnetic recording, exhibiting a specific surface area of 11 to 50 m^2/g, a magnetization of higher than 25 emu/g in a magnetic field of 10 kOe and a coercive force of 600 to 1100 Oe.

5. A process for producing plate-like barium ferrite particles of the formula $BaO.6Fe_2O_3$ for use in magnetic recording exhibiting a specific surface area in a range of 11 to 50 m^2/g, a magnetization of higher than 25 emu/g and a coercive force in a range of 600 to 1100 Oe, comprising the steps of

autoclaving an aqueous alkaline suspension of pH of higher than 11 which contains Fe(III) and Ba ions at an atomic ratio of Fe(III) to Ba ions of 6:1 to 8:1 at a temperature of 110° to 190° C., to form fine particles of $2BaO.9Fe_2O_3$,and then

autoclaving said aqueous suspension containing the thus formed $2BaO.9Fe_2O_3$ at a temperature of 280° to 320° C., thereby converting said fine particles of $2BaO.9Fe_2O_3$ into said plate-like barium ferrite particles.

4,548,802

CONTINUOUS FLOW SEPARATION WITH MOVING BOUNDARY SORPTION

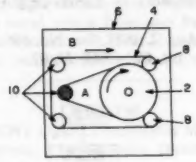
Leland C. Dickey, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 561,899, Dec. 15, 1983,. This application Aug. 6, 1984, Ser. No. 638,255

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[4] B01D *15/02, 15/08*

U.S. Cl. 423—659 **4 Claims**



1. A continuous process for separating components of a fluid mixture which comprises:

a. Forming at least one sorption zone and at least one desorption zone in a first separator comprising at least one roller, at least one belt, or a combination of at least one roller and one belt, at least one of the belts and rollers having sorbent material thereon in engagement so that the sorbent material forms a boundary seal between the sorption and desorption zones, said sorption material continuously moving back and forth between the sorption and desorption zones,

b. Causing a fluid mixture to flow into the sorption zone wherein the conditions are such to promote sorption of at least one of the components of the mixture by the sorbent material,

c. Creating conditions in the desorption zone such that the sorbed component will be desorbed when the sorbent material containing the sorbed component moves into the desorption zone, and

d. Conveying the product from at least one of said zones to at least one other separator and repeating steps a, b and c therein.

4,548,803

CONTINUOUS FLOW SEPARATION WITH MOVING BOUNDARY SORPTION

Leland C. Dickey, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 561,899, Dec. 15, 1983,. This application Aug. 6, 1984, Ser. No. 638,283

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

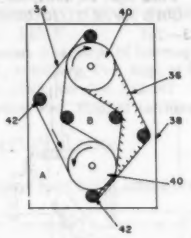
Int. Cl.[4] B01D *15/02, 15/08*

U.S. Cl. 423—659 **6 Claims**

1. A continuous process for separating components of a fluid mixture which comprises:

a. Forming at least one sorption zone and at least one desorption zone in a separator comprising at least one roller, at least one belt, or a combination of at least one roller and one belt, at least one of the belts and rollers having sorbent material thereon in engagement so that the sorbent material forms a boundary seal between the sorption and desorption zones, said sorption material continuously moving back and forth between the sorption and desorption zones,

b. Causing a fluid mixture to flow into the sorption zone wherein the conditions are such to promote sorption of at least one of the components of the mixture by a sorbent material, and



c. Creating conditions in the desorption zone such that the sorbed component will be desorbed when sorbent material containing the sorbed component moves into the desorption zone.

4,548,804

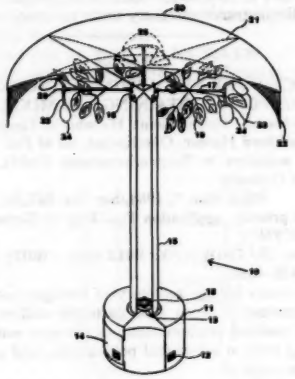
VISUAL-OLFACTORY HABITAT MIMIC FOR ASSESSMENT OF FRUIT FLY RESPONSE TO BEHAVIOR-MODIFYING CHEMICALS

D. Leroy Williamson, Kaneohe, Hi., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 26, 1984, Ser. No. 593,058

Int. Cl.[4] A61K *49/00*

U.S. Cl. 424—9 **17 Claims**



1. A method for assessment of tephritid fruit flies to behavior-modifying test chemical samples, which comprises placing the test chemical sample in a chamber, drawing air past the sample to enhance volatilization and increase the concentration of volatiles in the air in the chamber, blowing the volatile-laden air in the vicinity of a substrate which visually mimics the fruit fly plant host to provide a concentration of sample volatiles in the vicinity of the substrate to elicit a behavioral response in fruit flies in the vicinity of the substrate, and observing fruit fly response in response to the chemical sample.

7. An apparatus for the assessment of fruit flies to behavior-modifying test chemical samples, which comprises a substrate which visually mimics the fruit fly plant host, a chamber for

holding the chemical sample to be tested, pipe means connected at one end to said chamber and supporting said substrate at another end, and fan means for drawing air past the sample to enhance volatilization and concentrate the sample volatiles in the air and for blowing the volatile-laden air through the pipe means to the vicinity of the substrate to provide a continuous emission of volatiles around the substrate in a concentration sufficient to elicit a behavioral response in fruit flies in the vicinity of the substrate in response to the chemical sample.

4,548,805

NON-INVASIVE TEST FOR GASTRIC ACID

David A. Sack, 2117 Bellvale Rd., Fallston, Md. 21047, and Charles B. Stephensen, 3700 N. Charles St., Apt. #608, Baltimore, Md. 21218

Filed Dec. 27, 1983, Ser. No. 566,032
Int. Cl.[4] A61K *49/00*
U.S. Cl. 424—9 **2 Claims**

1. A method of testing the breath and belches of a patient for the purpose of determining the degree of gastric acidity on an ephemeral basis comprising the steps of: collecting exhaled air and belches over a short time period; administering an acid production stimulant, and approximately 30 minutes thereafter from 10 to 200 mg of finely divided magnesium in encapsulated form; collecting exhaled air and belches for at least 90 minutes following the administration of magnesium; measuring the volume of collected air and the free hydrogen content thereof, and determining the hydrogen excretion rate per given unit of time for both pre-magnesium and post-magnesium breathing; determining the excess breath hydrogen rate over the pre-magnesium breath hydrogen rate; and using said excess breath hydrogen rate as an indication of the pH and acid secretion of the digestive system.

4,548,806

PSYLLIUM HYDROPHILIC MUCILLOID COMPOSITION

John A. Colliopoulos, Evanston; David B. Paul, Lake Zurich, and James G. Young, Northbrook, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 401,433, Jul. 23, 1982, Pat. No. 4,459,280. This application Jul. 5, 1983, Ser. No. 510,051
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] A61K *9/00*
U.S. Cl. 424—35 **11 Claims**

1. A composition having improved dispersability and mixability in water consisting essentially of psyllium hydrophilic mucilloid having a water-soluble coating from at least about 3% by weight of the composition, selected from the group consisting of a hydrolyzed starch ogligosaccharide having a D.E. of from Zero to 30, a mono-or disaccharide, a polyglucose or a polymatose and sweetened with aspartame, saccharin, cyclamate or a combination thereof, and wherein the composition has a bulk density of from about 0.25 g/ml to about 0.40 g/ml.

4,548,807

MASTITIS PREVENTION

Geoffrey J. Westfall, P.O. Box 285, Rte. 6, Brooklyn, Conn. 06234, and Franklin D. Haase, Ridge Farm, Ill., assignors to Geoffrey J. Westfall, Brooklyn, Conn.

Filed Aug. 3, 1983, Ser. No. 519,909
Int. Cl.[4] A61L *9/04*; A61K *9/12*
U.S. Cl. 424—45 **8 Claims**

1. A method of treating a mammal to prevent mastitis which comprises applying by aerosol spray to the outer skin surface of a teat of the mammal a water-based disinfectant composition and chilling said outer skin surface to a surface temperature of about 25° to 35° F. for a time period of at least one second, said composition including a homogeneous mixture of water, a disinfectant and a water and alcohol soluble aerosol propellant carrier having the characteristics necessary to produce said chilling temperature upon volatilization, thereby causing the teat sphincter muscle to contract.

4. The method of claim 1, wherein said propellant is dimethyl ether.

4,548,808

LONG-ACTING ANHYDROUS ANTIPERSPIRANT COMPOSITIONS CONTAINING TRIACETIN

Leonard Chavkin, 340 W. Dudley Ave., Westfield, N.J. 07090

Filed Jun. 18, 1974, Ser. No. 621,378
Int. Cl.[4] A61K *7/32, 7/34, 7/38, 9/12*
U.S. Cl. 424—47 **7 Claims**

1. A substantially anhydrous antiperspirant composition having enhanced deodorant properties comprising

(a) 5–50 parts by weight of a micronized powdered antiperspirant active agent and

(b) 10–95 parts by weight of triacetin.

4,548,809

METHOD FOR MANUFACTURING A STOMATIC GARGLE

Paul S. T. Fung, Ste. 1406, No. 185, Sung Chiang Rd., and Yun-Tsu Chen, No. 3, Alley 18, La. 64, Nanking W. Rd., both of Taipei, Taiwan

Filed Mar. 27, 1984, Ser. No. 594,486
Int. Cl.[4] A61K *7/16, 7/18, 7/26*
U.S. Cl. 424—52 **5 Claims**

1. A method of manufacturing a stomatic gargle, comprising the steps of:

(1) forming a first liquid mixture including a small quantity of menthol effective to function as a fragrance, local anaesthetic and antiseptic the user's mouth, a very small quantity of eugenol, less than that of the menthol, effective to function as a bactericide, a pain killer and a light anaesthetic agent in the user's mouth, and

a quantity of eucalyptus oil approximate 10 times that of the menthol, effective to function as an antiseptic and bactericide in the user's mouth;

(2) dissolving a quantity of licorice effective to function as a sweetener, into a first quantity of 100° C. distilled water sufficient to dissolve the licorice, and passing the dissolved licorice and water through a filter to remove licorice residues to produce a second liquid mixture;

(3) adding a small quantity of sodium monofluorophosphate effective to function as a sterilizing agent and antiseptic agent for eliminating bacteria in the mouth to a second quantity of 30° C. distilled water effective to dissolve the sodium monoflurophosphate, and agitating the water and sodium monofluorphosphate until disolution is complete to produce a third liquid mixture;

(4) adding the second liquid mixture at a temperature in the range 30° C. to 50° C. to the third liquid mixture to form a fourth liquid mixture;

(5) adding a quantity of glycerol effective to increase viscosity, a very small quantity of perfume effective to provide a cool and fragrant flavor to the gargle, a very small quantity of non-ionic surfactant effective to function as cleanser in the mouth and reduce surface tension in the gargle, and a quantity of sodium dehydroacetate effective to function as a water softening agent, to the fourth liquid mixture to form a fifth liquid mixture;

(6) agitating the fifth mixture for about 3 to 7 minutes at a slow speed under 300 RPM to form a sixth liquid mixture;

(7) adding the first liquid mixture, and a very small quantity of perfumes and flavor additives effective to add a cool flavor to the gargle to the sixth liquid mixture to form a seventh liquid mixture;

(8) agitating the seventh liquid mixture until the seventh liquid mixture forms a turbid suspension; and

(9) adding sufficient quantities of distilled water, ethyl alco-

hol and chlorophyll to the turbid suspension to obtain a clear transparent green gargle.

4,548,810

METHOD OF LUBRICATING THE SKIN

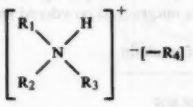
Albert Zofchak, 6 Gulfstream Blvd., Matawan, N.J. 07749

Continuation of Ser. No. 35,866, May 3, 1979, abandoned. This application May 8, 1981, Ser. No. 261,869

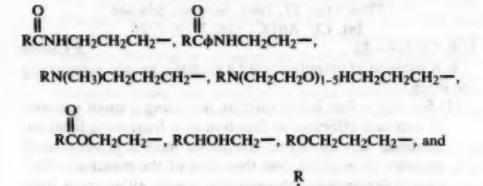
Int. Cl.[4] A61K *7/06, 7/15, 7/42*

U.S. Cl. 424—59 **12 Claims**

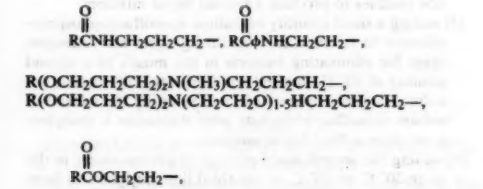
1. A process for the lubrication, emolliency, softening and conditioning of skin or hair comprising contacting said skin or hair with an effective amount of a composition comprising a tertiary amine salt of the formula:



wherein R_1 is selected from the group consisting of saturated and unsaturated aliphatic groups containing from about 8 to about 22 carbon atoms,



R_3 is selected from the group consisting of aliphatic groups containing from one to about two carbon atoms $H[O(CH_3)CHCH_2]_{1-15}$— and $H(OCH_2\ CH_2)_{1-15}$—, R_2 is selected from the group consisting of aliphatic groups containing from about 8 to about 22 carbon atoms,



$CH_3O[CH_2CH(CH_3)O]_{1-5}CH_2CH_2CH_2$—, $H[O(CH_3)CHCH_2]_{3-8}$—, $H[O(CH_3)CHCH_2]_{3-8}OCH_2CH_2$—, $RCHOHCH_2$—, $ROCH_2CH_2\ CH_2$—, aliphatic groups containing from one to about two carbon atoms and $H[O(CH_3)CHCH_2]_{1-15}$—, $H(OCH_2CH_2)_{1-15}$—, and R_4 is selected from the group consisting of

$RCH{=}CH_2SO_3$—, $RCONHCH(CH_3)CO_2$—, $ROSO_3$—, $RC_6H_5SO_3$—, $RO[CH_2CH_2O]_{1-10}CH_2CO_2$—, $RNHCOCH{=}CHCO_2$—, isostearic acid radical, ricinoleic acid radical, hydroxystearic acid radical, phenylstearic acid radical, and radicals of dibasic acids containing from about 6 to about 36 carbon atoms, wherein in all instances R represents a saturated and unsaturated aliphatic group containing from about 8 to about 18 carbon atoms, z is 0 or 1.

4,548,811

WAVING LOTION FOR COLD WAVING

Sanae Kubo, Sagamihara, and Fumiaki Nakamura, Yokohama, both of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,817

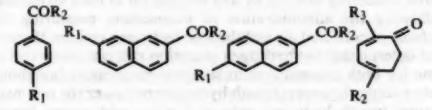
Claims priority, application Japan, Nov. 8, 1982, 57-195798

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

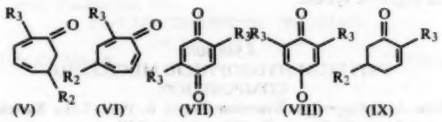
Int. Cl.[4] A61K *7/09, 7/11;* **A61L** *13/00*

U.S. Cl. 424—71 **4 Claims**

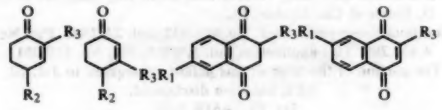
1. In an aqueous waving lotion for cold waving comprising (i) a mercapto compound, the improvement wherein such composition further contains (ii) an aqueous mixture obtained by heating (a) at least one compound selected from the group consisting of the compounds having the general formulae (I) to (XX),



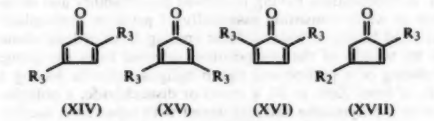
(I) (II) (III) (IV)



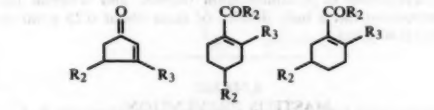
(V) (VI) (VII) (VIII) (IX)



(X) (XI) (XII) (XIII)



(XIV) (XV) (XVI) (XVII)



(XVIII) (XIX) (XX)

wherein R_1 is hydrogen, $COCH_3$, COC_2H_5, COC_3H_7, $OCOCH_3$, $OCOC_2H_5$, $OCOC_3H_7$, Cl, Br, I, $SCOCH_3$, SCN, CN, CF_3, N $(CH_3)_3$, or NO_2, R_2 is hydrogen or an alkyl group having 1 to 4 carbon atoms, and R_3 is hydrogen, a hydroxyl group, or a methyl group, and (b) at least one cyclodextrin selected from the group consisting of α-, β-, γ-, and δ-cyclodextrins in an aqueous phase at a mole ratio of (a):(b) = 1:9 to 1:1 at a temperature of 50° C. to 100° C., the solid content of the aqueous mixture (ii) in the waving lotion being 0.0002% to 40% by weight.

4,548,812
COMPOSITION FOR CONTROL OF BACTERIA AND VIRUSES

Lary L. Foley, 4443 20th St., San Francisco, Calif. 94114

Division of Ser. No. 440,395, Nov. 9, 1982, Pat. No. 4,456,722. This application Apr. 23, 1984, Ser. No. 603,059

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—78 **3 Claims**

3. A method of inhibiting the replication of herpetic viruses on a human host comprising applying to the infected area on the human host an aqueous solution of an association complex formed by the combination of a hexamethylenetetramine quaternary salt of 1,3-dichloropropene and a water-soluble homopolymer of ethylene oxide having an average molecular weight ranging from about 1,000,000 to about 5,000,000, the weight ratio of said quaternary salt to said homopolymer in said complex being from about 1:2 to about 1:8, and the concentration of said complex in said solution being from about 0.5 to about 5.0% by weight, in an amount effective in inhibiting said replication.

4,548,813
MEDICINAL EXTRACT OF THYMUS GLANDS

Rommon L. Lawson, Rte. 1, Box 33, China Spring, Tex. 76633

Filed Jan. 24, 1983, Ser. No. 460,609

Int. Cl.[4] A61K *35/12*

U.S. Cl. 424—95 **6 Claims**

1. A medicinal extract of thymus gland for the treatment of animals comprising an effective amount of a saline extract of ground whole thymus gland of chinchilla free of heat-precipitable impurities and injectable water.

4,548,814
COMPOSITION OF MATTER AND PROCESS

Kenneth L. Rinehart, Jr., Cunningham Township, Champaign County, Ill., assignor to The Board of Trustees of the University of Illinois, Urbana, Ill.

Division of Ser. No. 217,768, Dec. 18, 1980, which is a continuation-in-part of Ser. No. 186,932, Sep. 12, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 299,893

Int. Cl.[4] A61K *35/56, 35/00*

U.S. Cl. 424—95 **6 Claims**

1. A process for preparing didemnin in A, which has the following characteristics:

(1) molecular weight of 942.5678 (mass spectroscopy);

(2) molecular formula —$C_{49}H_{78}N_6O_{12}$;

(3) is soluble in methanol, ethanol, isopropanol, dioxane, ethyl acetate, and chloroform, and sparingly soluble in toluene, and insoluble in water;

(4) a characteristic infrared absorption spectrum as shown in FIG. 1 of the drawings;

(5) amino acid composition as follows: one mole of leucine, N-methylleucine, threonine, proline, N,O-dimethyltyrosine, and statine;

(6) an Rf of 0.46–0.52,

which comprises

(a) extracting a suitable marine tunicate from the family Didemnidae with MeOH:toluene (3:1);

(b) purifying the resulting extract with silica gel chromatography using the solvent system $CHCl_3$: MeOH in step gradient fashion; and

(c) recovering essentially pure didemnin A having an Rf of 0.046–0.52.

4,548,815
ANTIBACTERIAL AGENTS

Roger J. Ponsford, Horsham, and Thomas T. Howarth, Cranleigh, both of England, assignors to Beecham Group p.l.c., England

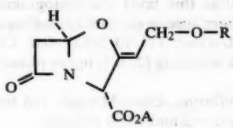
Division of Ser. No. 278,564, Jun. 29, 1981, , which is a continuation of Ser. No. 786,345, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,475, Oct. 7, 1976, abandoned. This application Oct. 3, 1983, Ser. No. 538,767

Claims priority, application United Kingdom, Oct. 13, 1975, 41897/75; Jan. 23, 1976, 02629/76; May 8, 1976, 19000/76; Nov. 27, 1976, 49570/76; Nov. 27, 1976, 49569/76; Dec. 11, 1976, 51808/76; Mar. 10, 1977, 10116/77; Mar. 16, 1977, 11116/77

Int. Cl.[4] A61K *35/00*

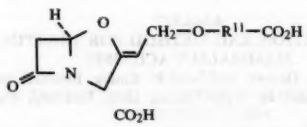
U.S. Cl. 424—114 **48 Claims**

1. A pharmaceutical composition for treating bacterial infections in humans and animals which comprises a synergistically effective amount of an ether of the formula (II):



(II)

or



(V)

or a pharmaceutically acceptable salt or a pharmaceutically acceptable este of a compound of the formula (V), wherein R is a hydrocarbon of up to 18 carbon atoms unsubstituted or substituted by halogen, a group of the formula OR^1, OH, $OCOR^1$, COR^1, CO_2R^1, NR^2COR^1, $NR^2CO_2R^1$, SOR^1, SO_2R^1, NH_2, NR_1R^2, NO_2, $CONR^1R^2$, carboxyl or a pharmaceutically acceptable salted carboxyl or by halogen and one of said groups, wherein R^1 is a hydrocarbon of up to 8 carbon atoms and R^2 is a hydrocarbon of up to 4 carbon atoms, or R is $CR^4R^5R^6$ wherein R^4 and R^5 are independently alkyl of up to 3 carbon atoms or phenyl unsubstituted or substituted by halogen or a group of the formula R^7 or OR^7 wherein R^7 is alkyl of up to 3 carbon atoms; and R^6 is hydrogen, alkyl of up to 3 carbon atoms or phenyl unsubstituted or substituted by halogen or a group of the formula R^8 or OR^8 wherein R^8 is alkyl of up to 3 carbon atoms, R^{11} is a hydrocarbon of 1 to 8 carbon atoms unsubstituted or substituted by halogen, a group of the formula OR^{12}, $OCOR^{12}$, COR^{12} or OH, or by halogen and one of said groups wherein R^{12} is alkyl of 1 to 4 carbon atoms, and A is a group such that CO_2A is a carboxylic acid moiety, a pharmaceutically acceptable salt or a pharmaceutically acceptable ester thereof, and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,548,816

ANTIBIOTIC SF-2288 AND ITS PREPARATION METHOD

Yasumitsu Kondo, Kawasaki; Takashi Shomura; Junko Yoshida, both of Yokohama; Kazuo Okano, Maebashi; Masaji Sezaki, Tokyo, and Tatsuo Itoh, Isehara, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,177

Claims priority, application Japan, Jun. 23, 1983, 58-113519

Int. Cl.[4] A61K *35/74;* **C12P** *1/06*

U.S. Cl. 424—116 **2 Claims**

1. Antibiotic SF-2288 having the following properties as free base:

(1) Appearance: White, amorphous powder

(2) Elemental analysis: Carbon 39.61%, hydrogen 6.40%, nitrogen 8.89%, oxygen 45.10% (percentage by weight)

(3) Specific optical rotation: $[\alpha]_D^{25}+323.3°$ (c 1.0, water)

(4) Solubility: Soluble in water and hardly soluble in methanol, ethyl acetate, chloroform, benzene and n-hexane

(5) Infrared absorption spectrum: Infrared absorption spectrum of SF-2288 in a KBr tablet showed the characteristic absorptions at 3375, 2920, 1682, 1455, 1335, 1260, 1150, 1090, 1010 and 862 cm^{-1}

(6) ^{1}Hn.m.r. spectrum: The spectrum in D_2O is shown in FIG. 2

(7) ^{13}Cn.m.r. spectrum: The spectrum in D_2O is shown in FIG. 3

(8) Electrophoretic nature: Basic; It moves 8 cm toward the cathode in pyridine-acetate buffer, pH 6.4 (3,500 V, 15 minutes); $RM_{Lys}0.9$

(9) Rf values on cellulose thin layer chromatograms: Methanol/10% ammonium acetate (1/1): 0.63; n-Propanol/-pyridine/acetic acid/water; (15/10/3/12): 0.0; Chloroform/methanol/17% ammonia (2/1/1; upper phase): 0.23

(10) Color reactions:

Positive: Molisch, anthrone, Elson-Morgan, red tetrazolium, Graig-Liebach and ninhydrin reagents

Negative: Sakaguchi, Tollens and Fehling reagents.

4,548,817

COMPOSITION AND METHOD FOR TREATING MAMMALIAN ACIDOSIS

Giles F. Filley, Denver, and Neal B. Kindig, Boulder, both of Colo., assignors to Webb-Waring Lung Institute, Denver, Colo.

Filed Jan. 20, 1984, Ser. No. 572,235

Int. Cl.[4] A67K *33/00*

U.S. Cl. 424—127 **9 Claims**

1. In a method of treating acidosis in a patient who is not breathing or is otherwise inadequately ventilated by an intervenous administration of a solution of sodium bicarbonate, all without damage to the patient's veins the improvement of raising the pH of the sodium bicarbonate solution by adding a solution containing a carbonate ion to the administered sodium bicarbonate solution to form a mixture for administration to the patient in which the hydrogen ion concentration is controlled.

4,548,818

COMPOSITION AND METHODS FOR THE TREATMENT OF CHRONIC OBSTRUCTIVE AIRWAY DISEASE AND CARDIAC DISEASE USING 3-ALKYLXANTHINES

Per G. Kjellin, Spjutgränd 10, 223 75 Lund, and Carl G. A. Persson, Slogstorps Molla, 240 33 Löberöd, both of Sweden

Filed Nov. 23, 1981, Ser. No. 323,955

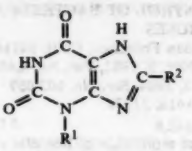
Claims priority, application Sweden, Oct. 20, 1978, 7810947

The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.[4] A61K *31/52;* **C07D** *473/06*

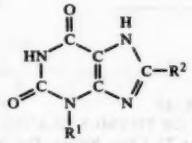
U.S. Cl. 514—263 **8 Claims**

1. A pharmaceutical preparation comprising as active ingredient an effective amount of a compound of the formula



or a physiologically acceptable salt thereof, in which formula R^1 is n-propyl, n-butyl, isobutyl, n-pentyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, cyclopropyl, cyclobutyl, cyclopentyl or cyclohexylmethyl, and R^2 is hydrogen or methyl, provided that R^2 is methyl when R^1 is n-propyl, n-butyl or isobutyl, in association with a pharmaceutically acceptable carrier for use in the treatment of chronic obstructive airway disease.

7. A method for the treatment of chronic obstructive airway disease in mammals, including man, characterized in administration to a host in need of such treatment of an effective amount of a compound of the formula



or a physiologically acceptable salt thereof, in which formula R^1 is n-propyl, n-butyl, n-pentyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, cyclopropyl, cyclobutyl, cyclopentyl or cyclohexylmentyl, and R^2 is hydrogen or methyl, provided that R^2 is methyl when R^1 is n-propyl, n-butyl or isobutyl.

4,548,819

DERIVATIVES OF 9-(2-HYDROXYETHOXYMETHYL) GUANINE

Erik D. A. De Clercq, Lebrunstraat 35-7, 3000 Leuven; Hubert J. H. E. Vander Haeghe, Predikherenberg 28, 3009 Winksele, and Roger H. C. Busson, Kapelstraat 67,, 3110 Rotselaar, all of Belgium

Filed Jun. 23, 1983, Ser. No. 507,712

Claims priority, application Netherlands, Jun. 29, 1985, 8202626

Int. Cl.[4] C07D *473/18;* **A61K** *31/52*

U.S. Cl. 514/261 **8 Claims**

1. 9-(2-0-Glycyloxyethoxymethyl)guanine.

4,548,820

XANTHINE COMPOUNDS

Gilbert Regnier, Chatenay Malabry; Claude Guillonneau, Clamart; Jacques Duhault, Croissy sur Seine, and Michelle Boulanger, Marly le Roi, all of France, assignors to Adir, Neuilly-sur-Seine, France

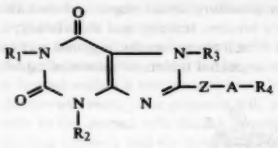
Filed Jul. 25, 1983, Ser. No. 516,946

Claims priority, application France, Jul. 28, 1982, 82 13155

Int. Cl.[4] C07D *473/08;* **A61K** *31/52*

U.S. Cl. 514—255 **13 Claims**

1. A compound selected from the group consisting of: xanthine compounds of the formula I:


(I)

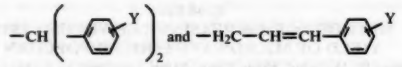
in which:

R_1 is selected from the group consisting of: hydrogen, and straight and branched alkyl having from 1 to 5 carbon atoms inclusive;

R_2 is selected from the group consisting of straight and branched hydrocarbon radicals having up to 6 carbon atoms inclusive, and these radicals having a double bond, phenyl, and benzyl;

R_3 is selected from the group consisting of hydrogen and alkyl, hydroxy alkyl and dihydroxyalkyl each having from 1 to 5 carbon atoms inclusive;

R_4 is selected from the group consisting of the group of the formula;

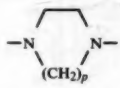


in which

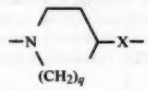
Y is selected from the group consisting of hydrogen, halogen, alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, and hydroxyl;

Z is selected from the group consisting of methylene and hydrocarbon radicals having from 2 to 5 carbon atoms and these hydrocarbon radicals substituted by hydroxyl, and

A is selected from the group consisting of the amino residues of the formula:



in which p is selected from the integers 2 and 3,

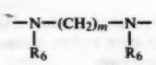


in which

q is selected from the integers 1 and 2, and

X is selected from the group consisting of a double bond oxygen and

in which R_5 is selected from the group consisting of hydrogen and alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive; and



in which

m is selected from the integers from 2 to 6; and

R_6 is selected from the group consisting of alkyls having from 1 to 5 carbon atoms inclusive; and

physiologically tolerable acid addition salts thereof.

4,548,821

FLAVORING WITH TERTIARY PENTAMETHYLINDANOL DERIVATIVES

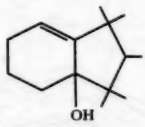
John B. Hall, Rumson, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 589,662, Mar. 14, 1984, Pat. No. 4,520,032. This application Feb. 15, 1985, Ser. No. 702,361

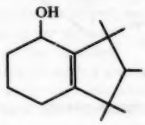
Int. Cl.[4] **A23L** *1/226, 1/235*

U.S. Cl. 426—3 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a walnut or blackberry flavored foodstuff or walnut or blackberry flavored chewing gum comprising the step of adding to said foodstuff or chewing gum from about 0.05 ppm up to about 150 ppm based on the total food composition or chewing gum composition of the compound having the structure:



in the absence of the compound having the structure:



4,548,822

ACID SOLUBLE ANNATTO COLORANT IN A POWDERED FORM

Thomas R. Schmidt, Niles, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

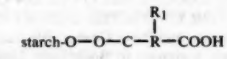
Filed May 2, 1984, Ser. No. 606,155

Int. Cl.[4] **A23L** *1/272, 1/27*

U.S. Cl. 426—96 **10 Claims**

1. A method for the preparation of an annatto colorant in the dry form which is resistant to precipitation when placed in an acidic aqueous medium which method comprises the steps of:

(a) providing an aqueous dispersion of a stabilizing agent which is a dextrinized waxy maize starch acid-ester of a substituted dicarboxylic acid characterized by the formula:



wherein R is $—CH_2)_n$ where n is 2 or 3 and R_1 is a hydrocarbon constituent selected from the group of alkyl, alkenyl, aralkyl and aralkenyl radicals containing from 5 to 18 carbon atoms;

(b) adding an alkaline, water soluble extract of annatto to the dispersion and blending the resultant to form a well-mixed and evenly colored mixture; and

(c) drying the resulting mixture to form free-flowing particles comprising the starch as stabilizing agent co-dried with the annatto.

4,548,823

EXTRUSION PROCESS FOR SHRIMP OR CRABMEAT ANALOG PRODUCTS USING BOILING GELLING BATH

Keisuke Morimoto, Congers, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,628
Int. Cl.[4] A23J *3/00*; A23L *1/04*
U.S. Cl. 426—104 **25 Claims**

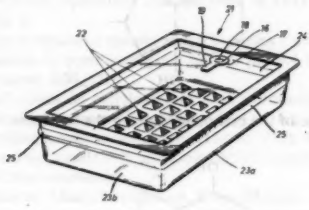
1. In a process for the formation of a fibrous material useful in the formation of a shrimp or crabmeat analog therefrom which is subject to freeze-thaw cycling by extruding an aqueous solution of protein and alginate into a gelling bath, the improvement which comprises maintaining said bath under boiling conditions during the formation of said fibers in said bath.

4,548,824

PACKAGE FOR STORING PERISHABLE PRODUCTS IN A REDUCED AIR ATMOSPHERE

Jerry L. Mitchell, Livingston, and Jesse A. Oberly, Euless, both of Tex., assignors to Pakor, Inc., Livingston, Tex.

Filed May 2, 1983, Ser. No. 490,972
Int. Cl.[4] B65D *21/08, 81/18, 81/20*; B65B *31/00*
U.S. Cl. 426—111 **2 Claims**



1. A package for storing perishable meat products, comprising:

a relatively rigid tray including side walls and a bottom wall with a region for receiving said meat products;

a flexible, gas impermeable cover for said tray, said cover having a small hole therein and a tab, said tab being resealably securable over said small hole, said side walls supporting said cover in a first position spaced above said meat receiving region of said tray, each of said side walls including a convoluted horizontal ridge line spaced from both the top and bottom of said side wall to allow said side walls to be easily vertically collapsed to enable said cover to assume a second position, spaced from said first position, and located closer to said meat receiving region of said tray said ridge line on adjacent side walls being alternatively convex and concave with said convex and concave lines meeting at each corner creating a hinge effect to render that corner and the walls more readily collapsible

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4,548,825

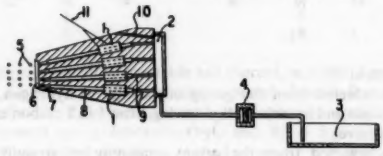
METHOD FOR INK-JET PRINTING ON UNCOATED TABLETS OR UNCOATED TABLET CORES

Günther Voss, Diessen, and Peter Gruber, Biberach, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 284,985, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 147,841, May 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 109,420, Jan. 3, 1980, Pat. No. 4,322,449, which is a continuation-in-part of Ser. No. 94,238, Nov. 14, 1979, abandoned. This application Oct. 3, 1983, Ser. No. 538,200
Int. Cl.[4] A61K *9/00*; A23L *1/00*
U.S. Cl. 426—383 **15 Claims**

1. In a method for applying indicia to the exterior surfaces of uncoated tablets or uncoated tablet cores comprising compressed, solid, granulated masses of material, where said exterior surfaces are non-uniform with regard to one or more properties of surface tension, texture, and absorbency,

the improvement which comprises dotting onto said exterior surfaces of said uncoated tablets or uncoated tablet cores



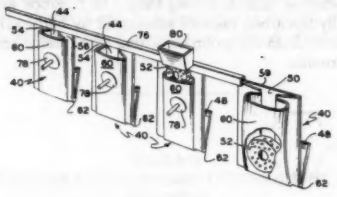
color solution or suspension by means of an ink-jet printer in specific quantity in the form of discrete droplets of specific volume to form indicia on said exterior surfaces of said uncoated tablets or uncoated tablet cores, said dotting being effected so that said indicia are applied to said exterior surfaces at a high speed.

4,548,826

METHOD FOR INCREASING THE VOLUMETRIC YIELD OF MICROWAVE COOKED POPCORN

James D. Watkins, Prior Lake, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Continuation of Ser. No. 166,373, Jul. 7, 1980, Pat. No. 4,450,180. This application Feb. 17, 1984, Ser. No. 581,028
Int. Cl.[4] B65B *43/00, 43/10, 43/12, 43/30*
U.S. Cl. 426—394 **14 Claims**



6. A method of filling and sealing a popcorn bag comprising,

providing a bag for storing and shipping popcorn, said bag being formed from flexible sheet material transparent to microwave energy and having first and second rectangular face panels each having parallel transversely extending top and bottom edges and parallel vertically extending side edges,

sections of interconnecting folded gusset material projecting centrally between the side edges of the face panels with the centrally projecting gussets approaching each other closely enough to divide the bag into first and second collateral tubes,

holding the bag in an upright position with the top edges of the panels uppermost,

expanding the first tube to open said tube by drawing the first face panel away from the second collateral tube,

maintaining the second collateral tube in a collapsed condition by keeping said second panel in contact with adjacent sections of gusset material

inserting a charge of popcorn and fat into the expanded tube by allowing the charge to fall into the tube from its open end by gravity,

the close proximity of the second panel of the bag and the gussets preventing transfer of the corn and fat during the filling operation into the collapsed tube,

sealing the bag and maintaining the bag in a collapsed condition during shipment and storage to prevent expansion and

outward folding of the gussets to thereby hold the charge of fat and corn substantially entirely within said first tube until the corn is popped,

the tubes being in communication with each other between the gussets whereby when the bag containing the popcorn is heated within a microwave oven by the application of microwave energy the popcorn will transfer from the first tube to the second tube during popping within the bag as the bag expands and the gussets move apart.

4,548,827

SEPARATE RECOVERY OF CAFFEINE AND COFFEE SOLIDS ADSORBED ON ACTIVATED CARBON

Saul N. Katz, Monsey; George E. Proscia, West Sayville, both of N.Y., and George L. Clisura, Weehawken, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,714
Int. Cl.[4] A23F *5/22*
U.S. Cl. 426—427 **10 Claims**

1. A process for separately recovering caffeine and non-caffeine solids adsorbed on activated carbon which comprises:

(a) contacting the activated carbon, containing the adsorbed caffeine and non-caffeine solids, with an aqueous basic solution;

(b) separating the activated carbon, containing essentially only caffeine, and said basic solution containing the desorbed non-caffeine solids;

(c) further contacting the activated carbon containing essentially only caffeine, with an aqueous acidic solution;

(d) separating the activated carbon and said acidic solution which solution contains the desorbed caffeine;

(e) recovering the non-caffeine solids from the aqueous basic solution;

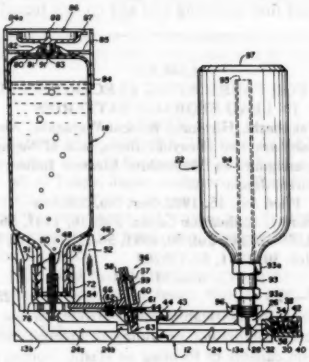
(f) recovering the caffeine from the aqueous acidic solution.

4,548,828

METHOD FOR MAKING CARBONATED BEVERAGES

Louis B. Meyers, 3507 Oaks Way, Pompano Beach, Fla. 33060

Division of Ser. No. 417,225, Sep. 13, 1982, Pat. No. 4,481,986. This application Aug. 2, 1984, Ser. No. 636,993
Int. Cl.[4] B01F *3/04*
U.S. Cl. 426—477 **14 Claims**



1. In a method of mixing a gas with a beverage liquid, supplying a gas under pressure to the liquid in a closed pouring container,

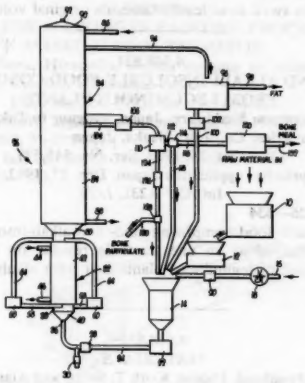
and venting the pouring container to the atmosphere at a place spaced from the supply of gas thereinto while continuing to supply the gas to cause some of the gas to escape from the pouring container after the gas passes through at least a portion of the liquid to agitate the liquid so as to enhance the more complete mixture of the gas with the liquid during the passage of the gas therethrough.

4,548,829

BONE EMULSIFYING METHOD

Wallace L. McGehee, 1004 West 88th Street Ter., Kansas City, Mo. 64114

Filed Jan. 23, 1984, Ser. No. 573,304
Int. Cl.[4] A23L *1/31*; A22C *17/00*
U.S. Cl. 426—518 **4 Claims**



1. A method for use in emulsifying animal bones in a continuous process comprising the steps of:

reducing the bones into particles;

combining the particles with a liquid to produce a slurry;

introducing the slurry into the lower end of an upright, tubular cooker and drawing off product having a specific density lower than that of the slurry at a point above said lower end after the contents of the cooker have been cooked to a desired extent and subjected to pressures from the column of liquid within the cooker to soften the particles; and

while the slurry is being cooked in the cooker, causing particles of the slurry to impinge against structure within the cooker that further disintegrates the particles to produce an emulsion.

4,548,830

INSTANT RICE GRUEL AND METHOD FOR PRODUCING SAME

Sadao Koyama, Toda, Japan, assignor to Tokiwado Kaminari Okoshi Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 568,092
Claims priority, application Japan, Sep. 12, 1983, 58-167700
Int. Cl.[4] A23L *1/18, 1/164*
U.S. Cl. 426—620 **12 Claims**

1. A method of producing instant rice gruel which comprises the steps of

(1) providing a batch of rice,

(2) washing said batch of rice with water so as to remove any sugar or oily substances thereon,

(3) contacting the batch of rice obtained in step (2) with a saline solution containing about 1 to 1.5% salt so that the rice will absorb water therein,

(4) treating the batch of rice obtained in step (3) with boiling water or steam to cause a first α conversion,

(5) treating the batch of rice obtained in step (4) with water at a temperature of about 40° to 60° C. for about 0.5 to 1 minute so that the rice will absorb additional water therein,

(6) subjecting the batch of rice obtained in step (5) with steam at a pressure of about 0.5 to 1 kg/cm^2 for about 10 to 15 minutes to cause a second α conversion,

(7) impregnating the batch of rice obtained in step (6) with water having a temperature of about 25° to 60° C. for about 0.5 to 1 minute so that the rice will have a more uniform water content,

(8) drying the batch of rice obtained in step (7) with hot air,

(9) aging the batch of rice obtained in step (7) so that the water content in the rice will become even more uniform, and

(10) heating the batch of rice obtained in step (9) to cause the rice to swell to at least 5 times its original volume.

4,548,831

ACID AND ALKALI INSOLUBLE FOOD COMPONENT FROM LEGUMINOUS PLANTS

Junichi Iwamura, Kashiwara, Japan, assignor to Tokiwa Kanpo Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 26, 1983, Ser. No. 545,577

Claims priority, application Japan, Dec. 17, 1982, 57-22287

Int. Cl.^{4} A23L *1/20*

U.S. Cl. 426—634 **2 Claims**

1. A health food comprising acid- and alkali-insoluble substances obtained as an unextractable residue on extracting defatted seed of leguminous plants first with alkali and then with acid.

4,548,832

MATERIALS

James L. Woodhead, Didcot; Keith T. Scott, and Alan Wilcockson, both of Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 18, 1983, Ser. No. 476,483

Claims priority, application United Kingdom, Mar. 19, 1982, 8208088

Int. Cl.^{4} B05D *1/10*; **C04B** *35/12, 35/48*

U.S. Cl. 427—34 **14 Claims**

1. A process for the preparation of a particulate material suitable for use as a thermal spraying powder which includes treating a mixture comprising chromia as a major component and a zirconia sol to gel the sol thereby to form a particulate intermediate material comprising chromia and zirconia gel and heating the intermediate material to produce a particulate material suitable for use as a thermal spraying powder.

13. A process comprising thermal spraying a particulate material comprising chromia and zirconia formed by heating a zirconia gel, said gel being formed from a mixture of a zirconia sol and a major amount of chromia.

14. A particulate material suitable for use as a thermal spraying powder comprising chromia and zirconia formed from a zirconia gel by heating, said gel being formed from a mixture of a zirconia sol and a major amount of chromia.

4,548,833

METHOD FOR PREPARING A MAGNETIC RECORDING MEDIUM

Hiroshi Hashimoto, and Tsutomu Okita, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1983, Ser. No. 461,702

Claims priority, application Japan, Jan. 28, 1982, 57-10867

Int. Cl.^{4} B05D *3/06*

U.S. Cl. 427—44 **18 Claims**

1. A method for preparing a magnetic recording medium, comprising the steps of:

providing a support base;

providing a coating composition comprising a ferromagnetic fine powder, a binder containing a compound capable of being polymerized with electron beam radiation, and a solvent, the composition having an apparent viscosity of 1 to 150 centipoise at a shearing speed of 4000 sec^{-1};

coating the composition on a surface of the support base to form a coated layer;

subjecting the coated layer to magnetic orientation while the coated layer is still wet;

irradiating the coated layer with an electrom beam; and

drying the coated layer to evaporate the solvent.

4,548,834

METHOD OF PRODUCING A JOSEPHSON TUNNEL BARRIER

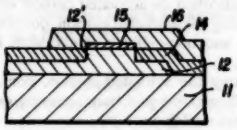
Hisanao Tsuge, and Takayoshi Yoshida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,553

Claims priority, application Japan, May 31, 1982, 57-92748; May 31, 1982, 57-92749; May 31, 1982, 57-92750; May 31, 1982, 57-92751; May 31, 1982, 57-92752; May 31, 1982, 57-92753; May 31, 1982, 57-92754

Int. Cl.^{4} H01L *39/22, 39/24*

U.S. Cl. 427—63 **12 Claims**



1. A method of producing a Josephson tunnel junction device comprising a first step of forming on a substrate a lower layer of superconducting film, a second step of selectively removing to a predetermined first depth a surface portion of said lower layer which does not include a predetermined portion of said lower layer so as to leave an exposed surface, a third step of forming a first insulating film at the exposed surface of said lower layer to a thickness such that the surface of said first insulating film is essentially coplanar with the surface of said predetermined portion, a fourth step of forming a tunnel barrier substantially coextensive with and on a surface of said predetermined portion of said lower layer, and a fifth step of forming an upper layer superconducting film on the surface of said first insulating film and on said tunnel barrier.

4,548,835

METHOD FOR FABRICATING ELECTRODES FOR USE IN LEAD STORAGE BATTERIES

Katsuhiro Takahashi, Hirakata; Keiichi Watanabe, Amagasaki; Naoto Hoshihara, and Hiroyuki Jinbo, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Jul. 15, 1982, Ser. No. 398,656

Claims priority, application Japan, Jul. 16, 1981, 56-111832; Jul. 30, 1981, 56-120286; Jul. 30, 1981, 56-120287; Jul. 30, 1981, 56-120288; Jul. 30, 1981, 56-120289

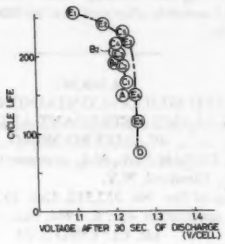
Int. Cl.^{4} H01M *4/04, 4/20*

U.S. Cl. 427—123 **25 Claims**

1. A method for fabricating an electrode for use in lead storage batteries comprising: providing an aqueous emulsion of a silicone resin capable of forming an elastic, porous product on breaking of the emulsion; said silicone resin comprising a hydroxylated polydiorganosiloxane, contacting said silicone emulsion with a finely divided active electrode material, and drying the contacted finely divided active electrode material, so that water is removed from the aqueous emulsion to form an elastic, porous silicone rubber matrix in association with and in intimate contact with the finely divided active electrode material throughout the electrode.

10. A method according to claim 1, wherein contact of the

aqueous emulsion comprises admixing the aqueous emulsion with a paste from which the electrode is formed.



11. A method according to claim **10**, wherein the emulsion is added to a mixture of a lead ingredient and water, and mixed while adding sulfuric acid.

4,548,836

METHOD OF MAKING AN INFRARED REFLECTIVE GLASS SHEET-II

Daryl J. Middleton, Nashville, Tenn., and Jodyne I. Grenier, Noblesville, Ind., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 25, 1985, Ser. No. 705,297
Int. Cl.[4] C03C *17/22*
U.S. Cl. 427—160 **6 Claims**

1. A method of making an infrared reflective glass sheet which comprises the steps of:

selecting a glass sheet formed of soda/lime silica glass;

heating said glass sheet to a temperature in a range from 900° to 1100° F.;

applying to a surface of said glass sheet an organic/tin ion-containing, chlorine-free compound to form a tin oxide seal coating having a columnar grain microstructure on said surface of said glass sheet;

applying to said tin oxide seal coating a coating of tin oxide formed from the decomposition of butyltin trichloride doped with fluoride, said columnar growth of said tin oxide seal coating being continued by a columnar growth in said tin oxide coating without any physical distinguishing microstructure characteristics between the tin oxide of each section of growth;

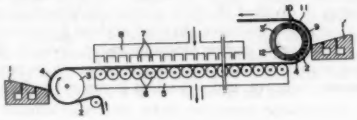
cooling said glass sheet to room temperature after application of said tin oxide seal coating and said tin oxide coating thereon.

4,548,837

METHOD AND APPARATUS FOR COATING

Tetsuya Yoshino; Takashi Kageyama; Kazuo Kato, and Takeshi Kishido, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP82/00428, § 371 Date Jun. 23, 1983, § 102(e) Date Jun. 23, 1983, PCT Pub. No. WO83/01585, PCT Pub. Date May 11, 1983
PCT Filed Nov. 4, 1982, Ser. No. 515,057
Claims priority, application Japan, Nov. 4, 1981, 56-175801
Int. Cl.[4] B05D *1/26, 1/30*
U.S. Cl. 427—209 **2 Claims**



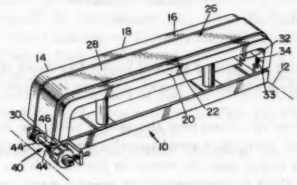
1. In a coating method wherein a coater and a gas injector are disposed in positions substantially opposite to each other on both sides of a support running continuously, and gas is jetted from said gas injector toward said support to coat it by said coater while supporting said support in a contactless manner, the improvement in that supply pressure of gas fed into said injector, a pressure loss in the inside of said injector and a tensile force applied to said support are set prior to coating so that supporting static pressure produced in a gap between said support and said injector becomes 1/10 through 1/1000 of the supply pressure, and a lift at the contact point with a coating solution from said coater has a value of 20 through 500μ.

4,548,838

METHOD FOR MASKING IN PAINTING PROCESS AND MASKING TOOL THEREFOR

Akira Sunohara, Hiratsuka, Japan, assignor to Nissan Shatai Company, Limited, Hiratsuka, Japan

Filed Sep. 26, 1984, Ser. No. 654,463
Claims priority, application Japan, Sep. 28, 1983, 58-179936; Mar. 12, 1984, 59-35186[U]
Int. Cl.[4] B05D *5/00, 1/32;* **B05C** *17/08*
U.S. Cl. 427—282 **13 Claims**



1. A masking device for an industrial painting process comprising:

a masking sheet along the lateral edges of which resilient wires are rigidly secured, said wires having first and second hooks at opposite ends thereof;

a support for supporting a workpiece to be painted, said support having a first end engageable to said first hooks of said wires, and a second end;

first means, provided at said second end of said support, for exerting tension on said wires to retain said masking sheet firmly onto the workpiece; and

second means, associated with said first means and responsive to ambient temperature, for reducing said tension, as temperature increases, at a rate of change dependent upon the rate of increase in ambient temperature.

13. A method of masking and unmasking a workpiece to be painted, comprising the steps of:

fitting a flexible mask over the workpiece;

applying tension to the mask in such a way as to cover the portions of the workpiece not to be painted;

holding the tension on the mask under known, relatively low temperature conditions;

painting the workpiece;

heating the environment around the workpiece and mask;

allowing the tension on the mask to decrease in accordance with increases in temperature above said known temperature; and

removing the mask from the workpiece.

4,548,839

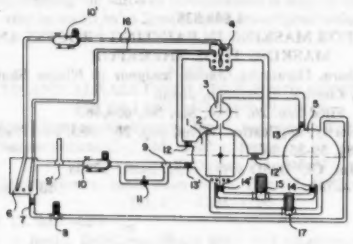
METHOD FOR WOOD PRESERVATION

Steen Moldrup, Magstraede 4, 1204 Copenhagen K, and Niels Moldrup, Fyenvej 23, 7330 Brande, both of Denmark

Filed Mar. 21, 1984, Ser. No. 591,798
Claims priority, application Denmark, Mar. 29, 1983, 1421/83
Int. Cl.[4] B05D *1/18, 1/40, 3/12*
U.S. Cl. 427—345 **5 Claims**

1. A method for preserving wood, the method including the steps of placing the wood into an autoclave, tranferring a

preservative liquid containing preservative substances dissolved into a solvent from a storage tank to an autoclave, pressurizing the autoclave to impregnate the wood with a portion of the preservative liquid, returning the remaining preservative liquid from the autoclave to the storage tank, reducing the pressure in the autoclave to a level below the saturation pressure of the solvent corresponding to the temperature in the autoclave, heating solvent vapor to a temperature higher than the boiling point of the solvent at the reduced pressure in the autoclave, and contacting the impregnated



wood with the heated solvent vapor to evaporate at least part of the solvent from the wood, wherein the improvement comprises:

said step of contacting the wood with the heated solvent vapor comprises mechanically circulating the heated solvent vapor past the wood in the autoclave; and

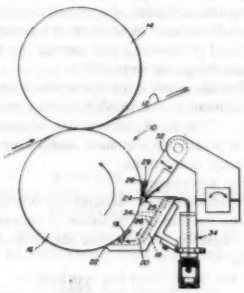
the method further comprises maintaining a vapor pressure in the autoclave as high as possible without reaching saturation pressure of the solvent so as to increase the heat capacity of the circulating solvent vapor.

4,548,840

HIGH SPEED COATING

Kenneth H. States, and Walter W. Smith, both of Graham, Tex., assignors to Graham Magnetics Incorporated, North Richland Hills, Tex.

Filed Jun. 15, 1984, Ser. No. 608,891
Int. Cl.[4] B05D *1/28, 3/12;* B05C *3/02*
U.S. Cl. 427—365 **19 Claims**



11. A process for high-speed coating a continuous web substrate with a thin coating of a liquid coating composition wherein said coating composition comprises a volatile solvent, said process comprising

(a) holding said coating composition in an elongate reservoir

(b) rotating said first surface to be coated upwardly while it bears against said coating composition and forms one wall of said reservoir

(c) agitating said coating composition along the entire upwardly-rotating side of said reservoir, thereby to achieve effective mixing of said coating

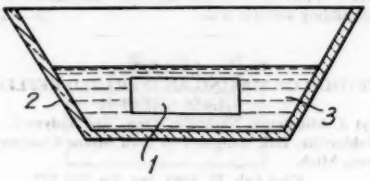
(d) transferring said coating onto a second surface within about 0.5 seconds after said first surface leaves the coating reservoir.

4,548,841

ACTIVATED SILICON-CONTAINING ALUMINUM COMPLEX FLAME RETARDANT AND METHOD FOR FLAMEPROOFING

Fred Bernat, Cliffside Park, N.J., assignor to San Mar Laboratories, Inc., Elmsford, N.Y.

Continuation of Ser. No. 312,512, Oct. 19, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,217
Int. Cl.[4] C09D *5/14*
U.S. Cl. 427—372.2 **4 Claims**



1. A composition for flame-proofing flammable articles comprising a slurry comprising activated-silicon containing aluminum particles prepared by the steps of

(a) contacting aluminum metal containing at least trace amounts of silicon with an acid of the type which will remove oxide coatings from and inhibit oxide formation thereon;

(b) simultaneously or thereafter contacting said aluminum with mercury or a source of mercury;

(c) immersing said mercury contacted aluminum metal in an acid bath at ambient temperature to not more than about 40° C., whereby particles are formed on the metal which on mixing with the acid bath form the slurry; and

(d) adjusting the pH of the slurry to 3.0 ± 0.2.

4,548,842

FATTY ETHENOID ACYLAMINOORGANOSILICON COMPOUNDS AND THEIR USE IN COMPOSITIONS FOR COATING GLASS

Eric R. Pohl, Thornwood, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 20, 1983, Ser. No. 563,980
Int. Cl.[4] B05D *1/36, 7/00;* B32B *9/00, 17/06*
U.S. Cl. 427—407.2 **17 Claims**

1. A method of enhancing the surface properties of glass articles which comprises coating the glass article with a fatty ethenoid acylaminoorganosilicon compound selected from the class of fatty ethenoid acylaminoorganosilicon compound represented by the formula:

$$Y[N(Y)_cR_{2-c}]_a[N(W)R^1]_b[N(Y)_bR_{2-b}^2]_a(HX)_w \quad (I)$$

wherein R and R^1 are individually selected from the group consisting of divalent alkylene groups containing from two to six carbon atoms inclusive, divalent arylene groups containing from six to twelve carbon atoms inclusive, divalent alkyl substituted arylene groups containing from seven to twenty carbon atoms inclusive, and a divalent group of the formula

$$\begin{matrix} & O & \\ & \| & \\ -CR^3- & & \end{matrix}$$

wherein R^3 is a divalent alkylene group containing from two to six carbon atoms inclusive; R^2 is a monovalent alkyl or aryl group containing from one to ten carbon atoms or hydrogen; W is either hydrogen, or

wherein R^4 is a monovalent hydrocarbon group containing from 8 to 24 carbon atoms and containing at least one double bond; Y is selected from the group consisting of hydrogen;

wherein R^4 is as defined above; R^2; and $-R^5Si(OR^6)_{3-a}(R^7)_a$ wherein R^5 is a divalent alkylene group containing from two to six carbon atoms inclusive, R^6 and R^7 are individually a monovalent alkyl or aryl group containing from one to six carbon atoms inclusive; and R^6 may also be a silicon containing moiety wherein the oxygen atom is directed bonded to the silicon atom of the R^6 silicon containing moiety; X is selected from the group consisting of a halogen atom, a hydroxy group, an ester group and an anhydride group and a has a value of zero, one, or two; b has a value of zero, one or two; c has a value of zero or one; x and y have values each that x+y equal one to thirty with the proviso that x is at least one; z is zero or one; w has a value equal to from zero to the sum of x+y+z provided that w does not exceed the total nitrogen atom in free amine form; with the proviso that at least one Y is $-R^5Si(OR^6)_{3-a}(R^7)_a$; and at least one other Y is

11. The method of claim 1 wherein the glass article is coated with the fatty ethenoid acylaminoorganosilicon compound in combination with a dispersing agent.

14. The method of claim 11 wherein added to the fatty ethenoid acylaminoorganosilicon compound and dispersing agent is an organic polymer and/or a fatty acid.

17. The method of claim 14 wherein the fatty ethenoid acylaminoorganosilicon compound and the dispersing agent are coated on to the glass article in a first step and the organic polymer and/or fatty acid is coated on to the glass article in a second step.

4,548,843

DECORATIVE PLASTIC TRIM STRIP

Masayoshi Kozuka; Tomihiko Mizutani, both of Anjyo, and Kohji Narita, Nagoya, all of Japan, assignors to Inoue MTP Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 216,291, Dec. 15, 1980, abandoned. This application May 14, 1984, Ser. No. 609,913

Int. Cl.⁴ B32B *15/08;* **B60R** *13/02, 13/04*

U.S. Cl. 428—31 **5 Claims**

1. A plastic trim strip for an automotive vehicle body, the strip having an outline from arcuate to C-shaped, comprising

(a) an outer surface layer which is made of cellulose acetate butyrate having a thickness of from 0.3 to 0.8 millimeters,

(b) an inner surface reinforcing layer means disposed in opposed relationship to and for attachment to said automotive vehicle body to maintain the shape of the trim and to increase the rigidity of the trim, which means is made of stainless steel or stainless steel clad aluminum having a thickness of from 0.1 to 0.5 millimeters and

(c) an intermediate layer which is located between the outer surface layer and the inner surface reinforcing layer means bonded to both the outer surface layer and the inner surface reinforcing layer means and which is made of a thermoplastic material selected from the group consisting of acrylonitrile-butadiene-styrene, acrylonitrile-ethylenepropylene-diene rubber-styrene, acrylonitrile-acryl rubber-

styrene, acrylonitrile-chlorinated polyethylene-styrene, methacryl-butadiene-styrene, polycarbonate, polyphenyleneoxide, polyphenylenesulfide, and polyamide.

4,548,844

FLEXIBLE COATED ARTICLE AND METHOD OF MAKING SAME

Howard I. Podell, 28 Beachfront La., New Rochelle, N.Y. 10805, and Albert Goldstein, Tinton Falls, N.J., assignors to Howard I. Podell, New Rochelle, N.Y.

Continuation of Ser. No. 445,760, Nov. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,889, Dec. 16, 1980, Pat. No. 4,482,577. This application Feb. 11, 1985, Ser. No. 700,057

Claims priority, application United Kingdom, Sep. 3, 1982, 8225200

Int. Cl.⁴ A61D *19/04;* **B05D** *3/10*

U.S. Cl. 428—35 **21 Claims**

1. A flexible rubber article of substantially tubular shape for use against human skin or tissue, said article having been treated by the application of an adherent coating of a hydrogel polymer to an outer surface of said article, said hydrogel coating imparting on said outer surface moisture absorbent properties manifested by a feeling of increased coolness on the part of a wearer of said article, and providing said surface with a compatible interface against human skin or tissue during use of said article, said article having been primed with a dilute acid and coated with a solution of said hydrogel polymer prior to final vulcanization of the rubber of said article.

4,548,845

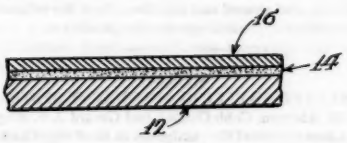
REDUCED BUILD-UP PRESSURE-SENSITIVE ADHESIVES

Robert E. Parsons, Painesville; Martha L. Westcott, Leroy Township, Lake County, and Susan L. Johnson, Euclid, all of Ohio, assignors to Avery International Corp., Pasadena, Calif.

Filed Apr. 21, 1983, Ser. No. 487,305

Int. Cl.⁴ C08K *5/06*

U.S. Cl. 428—40 **25 Claims**



1. A normally tacky, pressure-sensitive adhesive comprising, when deposited on a substrate a mixture of non-volatile components including (a) a water-insoluble elastomeric polymer, (b) a tackifier and (c) a polyoxyalkylene polyol having a molecular weight of about 200 to about 20,000 present at about 3 to about 45 percent of the total non-volatile weight of compo-

nents (a), (b) and (c), said adhesive components being substantially homogeneously dispersed when applied upon a substrate, said adhesive being water-insoluble and having improved resistance to build-up upon a knife blade when a plurality of adhesive-bearing substrates are sheared with said knife blade.

20. A label including (1) a release sheet defining a top surface and a bottom surface, one of said surfaces being removably adhered to (2) a layer of a water-insoluble, normally tacky, pressure-sensitive adhesive, said adhesive comprising as non-volatile components (a) a water-insoluble elastomeric polymer, (b) a tackifier and (c) a polyoxyalkylene polyol having a molecular weight of about 200 to about 20,000 present at about 3 to about 45 percent of the total non-volatile weight of components (a), (b) and (c), said adhesive components being substantially homogeneously dispersed at the time of application of said adhesive to said backing member, and said adhesive having improved resistance to build-up upon a knife blade when a plurality of said labels are sheared with said knife blade, and (3) a backing member defining a top surface and a bottom surface, the bottom surface of said backing member being adapted for receiving indicia and the top surface of said backing member being adhered to said adhesive.

4,548,846

PRESS-ON TYPE FINGER PULL

Thomas D. Kurtz, 510 Island View Rd., Rock Falls, Ill. 61071

Filed Nov. 8, 1984, Ser. No. 669,618

Int. Cl.[4] A47B *95/02;* **E05D** *1/00*

U.S. Cl. 428—40 **8 Claims**

1. A press-on type finger pull for application to the face of glass panels and the like comprising, a rigid body having a mounting surface at one side and finger engaging means at the side opposite the mounting surface, the mounting surface being embossed in a pattern to define ridges separated by shallow recesses, the apices of the ridges being coplanar, a thin preformed flat layer of pressure sensitive adhesive having a sheet of peelable cover material on one side and having the other side adhered to the ridges on the embossed mounting surface and extending across the recesses therebetween above the base of the recesses, the recesses having a length substantially greater than their width to disperse air bubbles trapped between the adhesive layer and the mounting surface over a substantial area of the mounting surface, the pressure sensitive adhesive layer being sufficiently resilient and deformable to distend into the recesses and disperse air bubbles trapped between the face of a panel and said one side of the adhesive layer when the latter is pressed against the panel.

4,548,847

DELAYED-SWELLING ABSORBENT SYSTEMS

Gerard M. Aberson, Cobb County, and Gerard J. F. Ring, Cherokee County, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

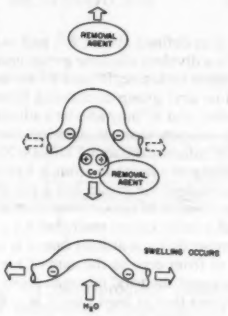
Filed Jan. 9, 1984, Ser. No. 569,417

Int. Cl.[4] A61F *13/20;* **B32B** *5/26;* **C09K** *3/00, 3/32;* **F26B** *5/16*

U.S. Cl. 428—74 **19 Claims**

1. An article of manufacture comprising an open support structure containing a water-swellable, water-absorbent system comprising an anionic polyelectrolyte reversibly cross-linked with polyvalent metal cations having a valence of at least two and a cation removal agent which upon contact with water-containing fluid is soluble therein and capable of reacting or complexing with the polyvalent metal cations cross-linking the anionic polyelectrolyte to thereby provide said system with delayed swelling characteristics when contacted with water-containing fluid, said system having delayed swelling characteristics when contacted with a water-containing fluid.

6. A water-swellable, water-absorbent system comprising an anionic polyelectrolyte reversibly cross-linked with polyvalent metal cations having a valence of at least two and a cation removal agent which upon contact with water-containing fluid is soluble therein and capable of reacting or complexing with the polyvalent metal cations cross-linking the anionic polyelectrolyte to thereby provide said system with delayed swelling characteristics when contacted with water-containing fluid,



said system having delayed swelling characteristics when contacted with a water-containing fluid.

16. A method for preparing an anionic polyelectrolyte reversibly cross-linked with a polyvalent metal cation to an extent that the superabsorbency characteristics of said polyelectrolyte have been substantially reduced comprising providing an imcompletely cross-linked anionic polyelectrolyte, contacting said polyelectrolyte with an aqueous solution of a salt of a polyvalent metal cation to complete cross-linking and form substantially nonabsorbent material, removing water to recover cross-linked polyelectrolyte and combining said cross-linked recovered polyelectrolyte with a cation removal agent under conditions such that said removal agent does not react or complex with the polyvalent metal cations cross-linking said polyelectrolyte.

4,548,848

HIGH DENSITY, WATER-REPELLENT TEXTILE FABRIC

Fumio Shibata, Uji, and Shunzo Kawasaki, Kashiwara, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 3, 1984, Ser. No. 606,643

Claims priority, application Japan, May 4, 1983, 58-77388; May 16, 1983, 58-84044; Aug. 12, 1983, 58-146571

Int. Cl.[4] D03D *15/04, 27/00*

U.S. Cl. 428—85 **18 Claims**

1. A high density, water-repellent textile fabric comprising a woven fabric comprising a number of warps and wefts each consisting of a number of extremely fine, water-repellent fibers having a denier of 1.2 or less, which woven fabric has at least one finely rugged surface having a sum of cover factors in warp and weft directions of said fabric of from 1,400 to 3,400, which has been determined in accordance with the equation:

$$CF = n\sqrt{de}$$

wherein CF represents the cover factor of said fabric surface in the warp or weft direction thereof, n represents the number of

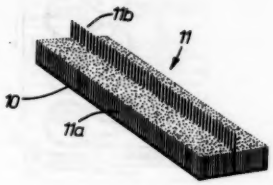
the warps or wefts per inch in said fabric, and de represents a denier of each warp or weft in said fabric.

4,548,849

SEALING STRIPS OF ROWS OF POLYPROPYLENE FIBERS AND ROWS OF POLYTETRAFLUOPOETHYLENE FIBERS

John F. C. Garnett, Ravensworth nr. Richmond, England, assignor to Linear Textiles Limited, Newton Aycliffe, England

Continuation-in-part of Ser. No. 259,411, May 1, 1981, abandoned. This application Jun. 20, 1983, Ser. No. 505,906
Claims priority, application United Kingdom, May 2, 1980, 8014612
Int. Cl.⁴ D04H *11/00*
U.S. Cl. 428—88 **23 Claims**



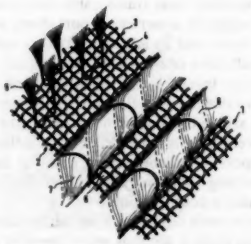
1. A sealing strip for forming a seal between two adjacent surfaces which are relatively movable by manual operation and comprising an elongate strip-like base for attachment to one of said surfaces, parallel rows of pile formed by fibres of a polypropylene yarns extending from the base to contact the other of said surfaces, and a polytetrafluoroethylene yarn which has a lower coefficient of friction than the polypropylene yarn and which is carried on the strip-like base with the pile of fibres to contact the other of said surfaces whereby when the sealing strip is compressed between said surfaces, the polytetrafluoroethylene yarn reduces the frictional force tending to prevent relative movement between said pile and the surface contacted thereby in a direction parallel to the length of said base.

4,548,850

PILE FABRIC WITH PILE-FREE POSITIONS

Ernst Stauder, Viersen, and Gerhard Hoffe, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Johs. Girmes & Co. AG, Grefrath, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,925
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403184
Int. Cl.⁴ B32B *3/02*
U.S. Cl. 428—88 **19 Claims**



1. A pile fabric comprising a woven substrate comprising warp threads aligned in a warp direction and weft threads aligned in a weft direction, an operatively bound pile component in a pile-bearing position, and a plurality of additional decorative threads in a pile-free position, whereby said additional decorative threads significantly affect the appearance of said pile fabric.

4,548,851

COMPOSITE MATERIAL

Marian B. Greer, R.R. #1, Box 74, Coulterville, Ill. 62237

Division of Ser. No. 342,609, Jan. 25, 1982, Pat. No. 4,405,542. This application Jul. 11, 1983, Ser. No. 512,715
Int. Cl.⁴ B32B *5/12*
U.S. Cl. 428—106 **4 Claims**

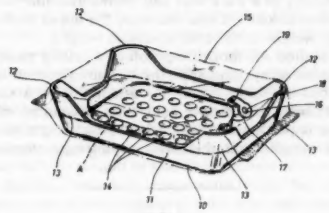
1. A composite rigid material formed from comminuted wood or wood like particles which comprises:
an amount of wood or wood-like particles of diverse sizes, said amount including at least about 25 weight percent of particles having a thickness of at least about 2.5 mm; and
a sufficient amount of a suitable adhesive to hold said material in a rigid condition, said material defining a void volume of at least about 10 percent.

4,548,852

METHOD AND APPARATUS FOR PACKAGING PERISHABLE PRODUCTS IN A REDUCED AIR ATMOSPHERE

Jerry L. Mitchell, Livingston, Tex., assignor to Pakor, Inc., Livingston, Tex.

Filed May 2, 1983, Ser. No. 490,971
Int. Cl.⁴ B65D *21/08, 81/18, 81/20;* B65B *31/00*
U.S. Cl. 426—111 **19 Claims**



1. A package for storing perishable meat products, comprising:
a relatively rigid tray including sidewalls and a bottom wall defining a region for receiving said meat products;
a flexible, gas impermeable cover for said tray, said cover having a small hole therein and a tab, said tab being resealably securable over said small hole; and
a collapsible support means, connected to said tray, and having a height greater than the height of the remainder of said tray for supporting said cover in a first position spaced above said meat receiving region of said tray, said support means being weakened to allow said support means to be easily collapsed to enable said cover to assume a second position, spaced from said first position, and located closer to said meat receiving region of said tray.

4,548,853

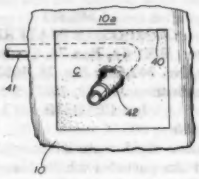
CLOSURE FOR A SURFACE OPENING HAVING AN OBJECT PASSING THEREFROUGH AND METHOD OF FORMING THE CLOSURE

Henry H. Bryan, 3727 El James Dr., Spring, Tex. 77373

Filed Apr. 2, 1984, Ser. No. 595,583
Int. Cl.⁴ B32B *3/10;* E04B *1/94*
U.S. Cl. 428—131 **12 Claims**

1. A penetration seal for a surface opening having an object passing therethrough comprising a non-liquid, non-combustible substance substantially filling the void in the opening and

an elastic coating over the substance and encapsulating the object adjacent its passage through the substance in the openings where said discontinuous film layer or layers are not present.



ing said elastic coating capable of elongating at least about 5 percent.

4,548,854

CEILING PRODUCT

Thaddeus F. Wach, Macon, Ga., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 532,746, Sep. 16, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,934

Int. Cl.[4] B32B *27/12, 33/00;* **E04B** *1/84, 5/52*

U.S. Cl. 428—138 **8 Claims**

1. A ceiling panel of fibrous construction having a decorative surface adapted to face a room environment and a second surface adapted to face a plenum area wherein said second surface has a moisture barrier comprising about 2 grams per square foot of a dried coating of an aqueous emulsion consisting essentially of a slack wax and triethanolamine with stearic acid, and an amount of silicone resin, the upper limit of which is 5% by weight of the total emulsion weight.

4. A method for moisture-proofing a ceiling panel of fiber construction comprising applying to one surface of said panel an aqueous emulsion consisting essentially of a slack wax, triethanolamine and stearic acid, and an amount of silicone resin, the upper limit of which is 5% by weight of the total emulsion weight, and thereafter drying said coated ceiling panel.

4,548,855

POLYESTER FILM FOR MAGNETIC RECORDING MEDIUM

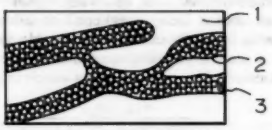
Masaaki Ono, Omihachiman; Masahiko Motegi, Hikone, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,649

Claims priority, application Japan, Nov. 2, 1982, 57-193159; Nov. 2, 1982, 57-193160; Dec. 28, 1982, 57-231209

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—147 **33 Claims**



1. A polyester film for a magnetic recording medium which comprises a polyester film, a discontinuous film layer or layers adhering closely to one surface or both the surfaces of said polyester film, said discontinuous film layer or layers having a thickness of not larger than 500 angstroms and being composed mainly of a water-soluble polymer, and fine particles present in said discontinuous film layer or layers and on the or each surface of said discontinuous film layer or layers, or on the exposed surface or surfaces of said polyester film in the por-

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4,548,856

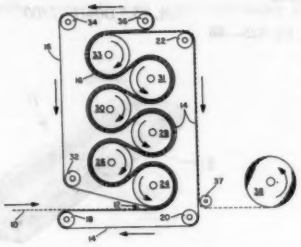
METHOD FOR FORMING SOFT, BULKY ABSORBENT WEBS AND RESULTING PRODUCT

Mir I. Ali Khan, and Richard J. Schmidt, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 495,225, May 16, 1983, Pat. No. 4,488,928. This application Aug. 22, 1984, Ser. No. 643,582

Int. Cl.[4] B32B *5/14*

U.S. Cl. 428—171 **12 Claims**



8. A bulky, soft, nonwoven web comprising a mixture of fibers including at least about 10% by weight of low melting thermoplastic fibers fused without substantially destroying fiber identities to form inter-fiber bonds in a pattern of compressed areas corresponding to a knuckle wire pattern and relatively low density areas of substantially unbonded fibers outside said pattern formed by application of heat to the web under tension between two wires.

4,548,857

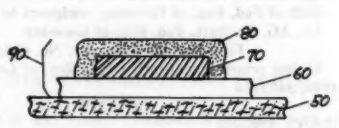
HEAT TRANSFERABLE LAMINATE

Richard J. Galante, Milford, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Continuation of Ser. No. 536,056, Sep. 26, 1983, abandoned. This application Sep. 21, 1984, Ser. No. 653,482

Int. Cl.[4] B32B *7/06, 7/10*

U.S. Cl. 428—200 **14 Claims**



1. An improved heat transferable laminate of the type including in sequence a carrier support sheet, a release layer, an ink design layer, and an adhesive coating over the ink design layer said adhesive coating not intermediate the carrier sheet and ink design layer for transfer of said ink design layer and said adhesive coating directly from the carrier support sheet to a receiving article upon application of heat to the carrier sheet while said receiving article contacts the adhesive coating, the carrier support sheet comprising material selected from the group consisting of paper and plastic film wherein the improved adhesive coating comprises:

an adhesive resin component which tackifies in a period of less than about 2 seconds when elevated to a temperature between about 200° to 600° F., the adhesive resin componeht comprises a blend of vinyl acetate/ethylene copolymer and a styrene-based resin,

wherein said adhesive resin component permits bonding of the ink design layer to plastic articles including plastic

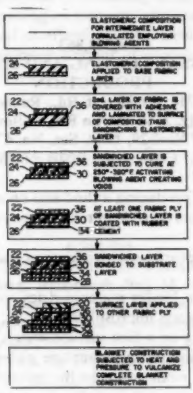
articles comprising a polyolefin without oxidizing the surface of said plastic article prior to said transfer.

4,548,858

METHOD OF MAKING A COMPRESSIBLE PRINTING BLANKET AND A COMPRESSIBLE PRINTING BLANKET PRODUCED THEREBY

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 27, 1984, Ser. No. 635,082
Int. Cl.[4] B32B *5/18, 5/22;* **B29C** *3/00*
U.S. Cl. 428—224 **13 Claims**


ELASTOMERIC COMPOSITION FOR INTERMEDIATE LAYER FORMULATED EMPLOYING BLOWING AGENTS
ELASTOMERIC COMPOSITION APPLIED TO BASE FABRIC LAYER
2nd. LAYER OF FABRIC IS COVERED WITH ADHESIVE AND LAMINATED TO SURFACE OF COMPOSITION THUS SANDWICHING ELASTOMERIC LAYER
SANDWICHED LAYER IS SUBJECTED TO CURE AT 250°-300°F ACTIVATING BLOWING AGENT CREATING VOIDS
AT LEAST ONE FABRIC PLY OF SANDWICHED LAYER IS COATED WITH RUBBER CEMENT
SANDWICHED LAYER BONDED TO SUBSTRATE LAYER
SURFACE LAYER APPLIED TO OTHER FABRIC PLY
BLANKET CONSTRUCTION SUBJECTED TO HEAT AND PRESSURE TO VULCANIZE COMPLETE BLANKET CONSTRUCTION

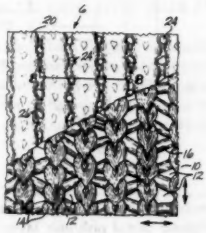
11. In a compressible printing blanket comprising a base layer, a surface layer, and a compressible intermediate layer, said intermediate layer having heat activated blowing agent gas produced voids in an elastomeric material; the improvement comprising a composite compressible intermediate layer having an elastomeric material sandwiched between two reinforcing fabric layers, said elastomeric material being in a vulcanized state and having said voids incorporated therein prior to its disposition between said base layer and said surface layer.

4,548,859

BREATHER MATERIAL AND METHOD OF COATING FABRIC WITH SILICONE RUBBER

William T. Kline, Seattle, and Robert F. Mittelstadt, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 12, 1984, Ser. No. 660,375
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—251 **22 Claims**



1. Breather material for use between an impervious layer and a workpiece in a system in which a vacuum is applied between said layer and said workpiece to cause said layer to exert substantially uniform pressure on said workpiece, said breather material comprising:

a flexible fabric that has opposite major faces at least one of which is ribbed, and a plurality of holes extending therethrough between said faces, said holes being spaced over essentially the entire extent of said faces; said fabric being stretchable in its general plane in at least two directions, said directions being substantially perpendicular to each other; and

a coating of silicone rubber release compound on said fabric covering at least the face opposite said ribbed face; said coating having a plurality of holes that extend therethrough and that generally coincide with said holes in the fabric, and any portions of said coating on said ribbed face substantially conforming to the configuration of said ribbed face, to provide passageways for a vacuum when the breather material is pressed between said impervious layer and said workpiece; and said release compound being flexible, stretchable, nonadherent to said workpiece, and not subject to damage or deterioration caused by contact with said workpiece.

4,548,860

ADHESIVE INTERLINING

Katsuhide Sakai, Osaka, and Noboru Matsui, Moriyama, both of Japan, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,297
Claims priority, application Japan, May 28, 1981, 56-82214
Int. Cl.[4] C08F *8/30;* **B32B** *27/00*
U.S. Cl. 428—290 **2 Claims**

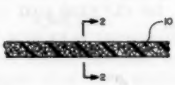
1. An interlining for imparting a desired bulge or silhouette to clothing, said interlining capable of being first adhesively adhered to said clothing under conditions at which the interlining is not molded to any particular shape and thereafter molded, in contact with said clothing, to a desired shape at conditions which do not affect the adherence of said interlining to said clothing, said interlining comprising randomly collected constituent fibers on which there is applied an adhesive capable of adhering said interlining to said clothing, wherein at least about 40% by weight of said fibers consist of heat softening fibers having a softening temperature lower than the melting temperature of said adhesive, said heat softening fibers having a contraction coefficient of 3.0% or less at their softening temperature.

4,548,861

FOAM RIGIDIZING PROCESS AND PRODUCTS PRODUCED THEREWITH

John M. Barnes, Milwauke, Oreg.; Robert G. Haley, Auburn, and George E. Trepus, Jr., Enumclaw, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1983, Ser. No. 537,728
Int. Cl.[4] C08G *18/14;* **B32B** *5/18, 3/26;* **B29J** *1/02*
U.S. Cl. 428—322.7 **22 Claims**



1. The method of rigidizing a non-structural, flexible, open cell foam sheet comprising the steps of:

(a) forming a flowable foamable resinous material characterized by its ability to produce a rigid structural element when foamed and cured;

(b) placing the flowable foamable resinous material in a heated vented mold defining a given predetermined volume of space;

(c) positioning a non-structural, flexible, open cell foam

sheet within the heated vented mold in face-to-face relation with the flowable foamable resinous material and wherein the non-structural, flexible, open cell foam sheet is in the non-compressed state and essentially fills the given predetermined volume of space within the mold;

(d) closing the heated vented mold and permitting the flowable foamable resinous material to expand and form in an exothermic reaction whereby the heat and pressure generated cause the flowable foamable resinous material to expand into and uniformly through and throughout the non-structural, flexible, open cell, non-compressed foam sheet without compressing and/or damaging the cellular walls of the open cell non-compressed foam sheet and with excess foamed resinous material escaping from the vented mold through the vents therein; and,

(e) curing the uniformly impregnated open cell foam sheet and the expanded foamed resinous material impregnated therein to form a composite structural panel comprising: (i) a non-structural, flexible, open cell foam sheet having the same dimensions as when initially positioned within the mold in step (c); and (ii), a rigid essentially closed cell structural foam uniformly dispersed throughout the interstices of the non-structural, flexible, open cell, non-compressed foam sheet.

13. A lightweight, rigid, structural panel comprising, in combination, a non-structural, flexible, open cell, non-compressed foam sheet which occupies a given predetermined volume of space and an essentially closed cell structural foam uniformly distributed throughout the interstices of said open cell non-structural, flexible, non-compressed foam sheet so as to form a structural panel occupying essentially the same given predetermined volume of space as said non-structural, flexible, open cell, non-compressed foam sheet.

18. A lightweight, rigid, electromagnetic wave absorber comprising, in combination:

(a) a non-structural, flexible, open cell foam sheet which occupies a given predetermined volume of space and which is in the non-compressed state, said open cell foam sheet having a multiplicity of dielectric and/or magnetic particles dispersed throughout the open cell structure of said foam sheet which forms a matrix-like support therefore; and,

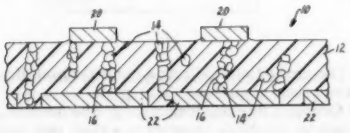
(b) an essentially closed cell structural foam uniformly distributed throughout the interstices of said non-structural, flexible, open cell, non-compressed foam sheet so as to form a lightweight, rigid, electromagnetic wave absorber occupying essentially the same given predetermined volume of space as said non-structural, flexible, open cell, non-compressed foam sheet.

4,548,862

FLEXIBLE TAPE HAVING BRIDGES OF ELECTRICALLY CONDUCTIVE PARTICLES EXTENDING ACROSS ITS PRESSURE-SENSITIVE ADHESIVE LAYER

Richard B. Hartman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 4, 1984, Ser. No. 646,825
Int. Cl.[4] B32B *3/00, 15/00*
U.S. Cl. 428—323 **20 Claims**



1. Flexible tape that can adhesively make individual electrical connections between multiple pairs of electrodes without short circuiting electrodes of either array, said tape comprising a pressure-sensitive adhesive layer containing electrically conductive particles in an amount providing less than ten percent by volume of the layer, each of the particles having a ferromagnetic core and an electrically conductive surface, the maximum dimension of substantially every particle being less than the thickness of the layer, the particles together forming a large number of discrete, electrically conductive bridges extending through the thickness of the layer, the adhesive between individual bridges rendering the layer laterally nonconductive.

4,548,863

FRANGIBLE SEAL COATING AND ITS METHOD OF PRODUCTION

Irwin A. Hicks, 714 Woodcrest Rd., Radnor, Pa. 19087, and Donald C. Ruddy, 2545 Martin Rd., Willow Grove, Pa. 19090

Filed Nov. 29, 1984, Ser. No. 676,096
Int. Cl.[4] C08K *3/40;* **B32B** *27/38, 27/14*
U.S. Cl. 428—325 **8 Claims**

1. A method of producing a fluid seal on at least one surface of a pair of members capable of relative movement, comprising the steps of:

coating said one surface with a layer of resin binder material; and

before said resin binder material dries, covering said layer with hollow glass microspheres.

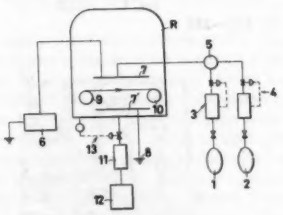
7. A seal coating on a first surface which moves relative to a second surface comprising a mixture of hollow glass microspheres in epoxy resin wherein the mixture has a material gradient such that it is substantially all epoxy resin at said first surface and substantially all hollow glass microspheres at its boundary away from said first surface.

4,548,864

MAGNETIC RECORDING MEDIUM HAVING AN ORGANIC METAL UNDERLAYER

Masatoshi Nakayama, and Toshiaki Izumi, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,189
Claims priority, application Japan, Oct. 29, 1982, 57-188984
Int. Cl.[4] G11B *5/62*
U.S. Cl. 428—336 **1 Claim**



1. A magnetic recording medium comprising a base, a plasma-polymerized organic metal polymer layer formed on said base, the metal of said organic polymer being selected from the group consisting of Sn, Ti, Al, Co, Fe, Cu, Ni, Mn, Zn, Pb, In, Hg, Mg, Au, Ag, and Cd, said plasma-polymerized layer having a thickness of 10 to 100 angstroms, and a thin ferro-magnetic metallic film formed on said plasma-polymerized layer.

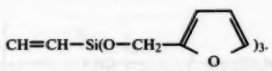
4,548,865
SILANES USEFUL AS ANTI-TREEING ADDITIVES

Harry Braus; Anthony Barlow, and Melvin F. Maringer, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corpooration, New York, N.Y.

Division of Ser. No. 575,975, Feb. 1, 1984, Pat. No. 4,514,536.
This application Jan. 11, 1985, Ser. No. 690,704
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—379 7 Claims

1. A method of stabilizing a polymeric insulated electrical conductor against water treeing and electrical treeing which comprises:

coating an electrical conductor with an insulating effective amount of a polymeric insulating composition, said composition comprising an intimate admixture of a polymeric component and an effective water treeing and/or electrical treeing inhibitor amount of a compound having the general structure:



4,548,866
HIGH STRENGTH HOLLOW FILAMENT YARN

Colleen W. Cordova, Richmond; Brij M. Mago; Garland L. Turner, both of Chesterfield, and William D. Braswell, Chester, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 18, 1983, Ser. No. 542,944
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—398 14 Claims

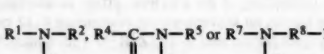
1. A yarn containing a plurality of synthetic polymer filaments, said filaments each having a continuous void throughout its length and an outside diameter ranging from 0.02 to 0.20 mm, said yarn having a filament to yarn strength translation efficiency of at least 98 percent, a drawn denier of 250 to 1500, a tenacity of a least 6.0 gram per denier, and a density of less than one, wherein the cross-sectional area of the void is 3 to 50 percent of the cross-sectional area bounded by the perimeter of the filament.

4,548,867
FLUORINE-CONTAINING SYNTHETIC RESIN SHAPED ARTICLES HAVING IMPROVED SURFACE PROPERTIES AND A METHOD FOR THE PREPARATION THEREOF

Susumu Ueno; Hirokazu Nomura, both of Ibaraki, and Kiyoshi Imada, Saitama, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,833
Claims priority, application Japan, Aug. 13, 1982, 57-140661
Int. Cl.[4] C07G *13/00;* B32B *27/00*
U.S. Cl. 428—409 8 Claims

1. A shaped article of a fluorine containing synthetic resin characterized in that the surface thereof has been subjected to exposure to an atmosphere of low temperature plasma under a pressure of 10 Torr or below comprising a nitrogen-containing gaseous organic compound represented by the general formula

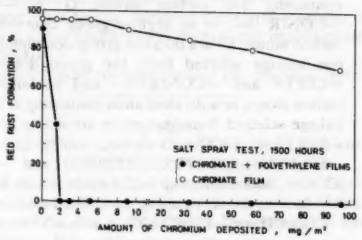


in which R^1, R^7, and R^9 are each a substituted or unsubstituted monovalent hydrocarbon group, R^2, R^3, R^4, R^5, R^6, R^{10} and R^{11} are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group and R^8 is a substituted or unsubstituted divalent hydrocarbon group.

4,548,868
SURFACE TREATMENT OF ZINC ALLOY ELECTROPLATED STEEL STRIPS

Kazuma Yonezawa; Toshikuni Tanda, and Hirotake Ishitobi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jan. 2, 1985, Ser. No. 688,425
Claims priority, application Japan, Jan. 17, 1984, 59-6061
Int. Cl.[4] B32B *9/04;* B05D *3/02;* C23C *1/10*
U.S. Cl. 428—446 5 Claims


RED RUST FORMATION, %
SALT SPRAY TEST, 1500 HOURS
CHROMATE + POLYETHYLENE FILMS
CHROMATE FILM
AMOUNT OF CHROMIUM DEPOSITED, mg/m²

1. A method for surface treating a zinc alloy electroplated steel strip for improving the corrosion resistance, comprising the steps of

forming a chromate film on the zinc alloy electroplated steel strip in a weight of 2 to 60 mg/m^2 of chromium, and

applying an aqueous composition comprising 100 parts by weight of a dispersion of a carboxylated polyethylene resin having 3 to 20 mol % of carboxyl groups, 10 to 30 parts by weight of a water-soluble melamine resin, and 10 to 60 parts by weight of colloidal silica to the chromated strip, all the parts by weight being based on the solids of the respective components, and then drying the composition on the strip at a strip temperature of at least 130° C. to form a resinous coating in a weight of 0.3 to 5 g/m^2.

4. A zinc alloy electroplated steel strip having improved corrosion resistance, comprising

a steel strip,

a zinc alloy layer electroplated on the strip,

a chromate film formed on the zinc alloy layer in a weight of 2 to 60 mg/m^2, and

a coating cured to the chromate film and comprising 100 parts by weight of a polyethylene resin having 3 to 20 mol % of carboxyl groups, 10 to 30 parts by weight of a water-soluble melamine resin, and 10 to 60 parts by weight of colloidal silica and weighing 0.3 to 5 g/m^2.

4,548,869
ELEMENT FOR ELECTROPHORESIS

Masashi Ogawa, Asaka; Hisashi Shiraishi, and Teppei Ikeda, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

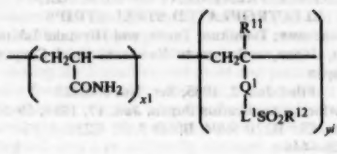
Filed Mar. 12, 1984, Ser. No. 588,752
Claims priority, application Japan, Mar. 11, 1983, 58-39282
Int. Cl.[4] B32B *27/08;* C08L *5/00, 5/12;* G01N *31/00*
U.S. Cl. 428—474.7 6 Claims

1. An element for electrophoresis comprising the following three-layer structure laminated in the order:

(I) a support layer;

(II) an adhesive layer comprising a polymer having at least one repeating unit selected from the group consisting of:

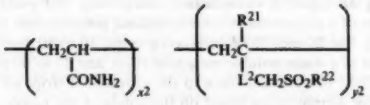
(1) a repeating unit having the formula (1):



(1)

in which R^{11} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; Q^1 is —COO—, —CON(R^{11})—, or an arylene group containing 6–10 carbon atoms; L^1 is a divalent group containing at least one linkage selected from the group consisting of —COO— and —CON(R^{11})— and containing 3–15 carbon atoms, or a divalent atom containing at least one linkage selected from the group consisting of —O—, —N(R^{11})—, —CO—, —SO—, —SO_2—, —SO_3—, —SO_2N(R^{11})—, —N(R^{11})CON(R^{11}) and —N(R^{11})COO—, and containing 1–12 carbon atoms, in which R^{11} has the same meaning as defined above; R^{12} is —CH=CH_2 or —$CH_2CH_2X^1$, in which X^1 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^1 by a base; and x^1 and y^1 both representing molar percents range from 0 to 99 and from 1 to 100, respectively, and x^1+y^1 is not less than 90;

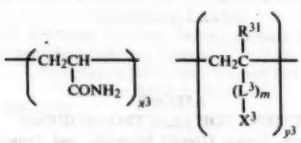
(2) a repeating unit having the formula (2):



(2)

in which R^{21} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; R^{22} is —CH=CH_2 or —$CH_2CH_2X^2$, in which X^2 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^2 by a base; L^2 is a divalent group selected from the group consisting of an alkylene group containing 1–6 carbon atoms, an arylene group containing 6–12 carbon atoms, —COZ^2—, and —COZ^2R^{23}—, in which R^{23} is an alkylene group containing 1–6 carbon atoms, or an arylene group containing 6–12 carbon atoms, and Z^2 is the oxygen atom or NH; and x^2 and y^2 both representing molar percents range from 10 to 95 and from 5 to 90, respectively, and x^2+y^2 is not less than 90; and

(3) a repeating unit having the formula (3):



(3)

in which R^{31} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; L^3 is a divalent linkage group containing 1–20 carbon atoms; X^3 is an active ester; x^3 and y^3 both representing molar percent range from 0 to 95 and from 5 to 100, respectively, and x^3+y^3 is not less than 90; and m is 0 or 1; and

(III) a medium layer for electrophoresis comprising an aqueous polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a cross-linking agent in the presence of water, and a compound containing at least one carbamoyl group serving as modifier.

4,548,870

ELEMENT FOR ELECTROPHORESIS

Masashi Ogawa, Asaka; Hisashi Shiraishi, and Teppei Ikeda, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 12, 1984, Ser. No. 588,751

Claims priority, application Japan, Mar. 11, 1983, 58-39283

Int. Cl.[4] B32B *27/08;* **C08L** *5/00, 5/12;* **G01N** *31/00*

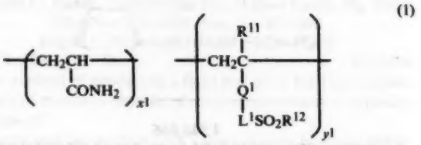
U.S. Cl. 428—474.7 **8 Claims**

1. An element for electrophoresis comprising the following three-layer structure laminated in the order:

(I) a support layer;

(II) an adhesive layer comprising a polymer having at least one repeating unit selected from the group consisting of:

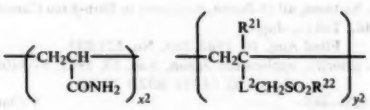
(1) a repeating unit having the formula (1):



(1)

in which R^{11} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; Q^1 is —COO—, —CON(R^{11})—, or an arylene group containing 6–10 carbon atoms; L^1 is a divalent group containing at least one linkage selected from the group consisting of —COO— and —CON(R^{11})— and containing 3–15 carbon atoms, or a divalent atom containing at least one linkage selected from the group consisting of —O—, —N(R^{11})—, —CO—, —SO—, —SO_2—, —SO_3—, —SO_2N(R^{11})—, —N(R^{11})CON(R^{11}) and —N(R^{11})COO—, and containing 1–12 carbon atoms, in which R^{11} has the same meaning as defined above; R^{12} is —CH=CH_2 or —$CH_2CH_2X^1$, in which X^1 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^1 by a base; and x^1 and y^1 both representing molar percents range from 0 to 99 and from 1 to 100, respectively, and x^1+y^1 is not less than 90;

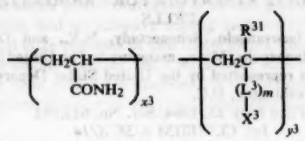
(2) a repeating unit having the formula (2):



(2)

in which R^{21} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; R^{22} is —CH=CH_2 or —$CH_2CH_2X^2$, in which X^2 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^2 by a base; L^2 is a divalent group selected from the group consisting of an alkylene group containing 1–6 carbon atoms, an arylene group containing 6–12 carbon atoms, —COZ^2—, and —COZ^2R^{23}—, in which R^{23} is an alkylene group containing 1–6 carbon atoms, or an arylene group containing 6–12 carbon atoms, and Z^2 is the oxygen atom or NH; and x^2 and y^2 both representing molar percents range from 10 to 95 and from 5 to 90, respectively, and x^2+y^2 is not less than 90; and

(3) a repeating unit having the formula (3):



(3)

in which R^{31} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; L^3 is a divalent linkage group containing 1–20 carbon atoms; X^3 is an active ester; x^3 and y^3 both representing molar percent range from 0 to 95 and from 5 to 100, respectively, and x^3+y^3 is not less than 90; and m is 0 or 1; **and**

(III) a medium layer for electrophoresis comprising an aqueous polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a crosslinking agent in the presence of water.

4,548,871

MAGNETIC RECORDING MEDIUM

Kouji Kobayashi; Kiyoshi Noguchi, and Suguru Takayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 562,002
Claims priority, application Japan, Dec. 26, 1982, 57-232698
Int. Cl.⁴ G11B *5/66*
U.S. Cl. 428—593 **8 Claims**

1. A magnetic recording medium which comprises a magnetic layer formed on a substrate and comprising Co, or Co and one to three elements selected from the group consisting of Ni, Cr and O, said magnetic layer comprising sequentially from the substrate side, a first portion composed of crystal particles which are not inclined relative to the normal line of the principal plane of the substrate, a second portion composed of columnar crystal particles which are inclined relative to the normal line of the principal plane of the substrate, and a third portion composed of crystal particles which are not inclined relative to the normal line of the principal plane of the substrate.

4,548,872

PROTECTION PROCESS OF FLAT ROLLED STEEL SECTIONS BY MEANS OF MULTI-LAYER ELECTROLYTIC PLATING IN PARTICULARLY AGGRESSIVE ENVIRONMENTS

Carlo Lavezzari, Varzi, Italy, assignor to Zincroksid S.p.A., Turin, Italy

Filed Jul. 24, 1984, Ser. No. 633,796
Claims priority, application Italy, Aug. 11, 1983, 22517 A/83
Int. Cl.⁴ C03C *27/02, 27/04;* **C25D** *7/00*
U.S. Cl. 428—633 **17 Claims**

1. An improved process for the protection, in particularly corrosive environments, of flat rolled steel sections which have a zinc base plating layer composed of zinc or zinc alloys and wherein a multi-layer electrolytic plating of a layer consisting of metal chromium and thereover a layer consisting of chromium oxide is deposited on the zinc base plating layer, comprising chemically passivating the zinc base plating layer of said flat rolled steel sections in a chromic anhydride solution prior to effecting said multi-layer electrolytic plating.

12. A product obtained according to the process of any one of claims **1** to **11**, composed of a flat steel rolled section in form of roll, sheet or plate, up to 2500 mm wide and up to 10 mm thick, one or both faces being plated with a zinc base layer up to 100 mm thick on each plated face in which the said zinc base layer is passivated in a chromic anhydride solution, and in which on the said passivated layer there are a layer of chromium at least 0.005 g./m.^{2} thick and a layer of chromium oxide at least 0.001 g./m.^{2} thick, the said chromium and chromium oxide layers being electrolytically applied.

4,548,873

MAGNETIC RECORDING MEDIA WITH OXYFATTY ACID LUBRICANT

Nobuyuki Yamamoto; Yoshito Mukaida; Nobuo Tsuji, all of Kanagawa; Yuzo Higaki, and Toshihisa Okamura, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1983, Ser. No. 538,725
Claims priority, application Japan, Oct. 1, 1982, 57-170945
Int. Cl.⁴ G11B *5/70*
U.S. Cl. 428—695 **16 Claims**

1. A magnetic recording medium, comprising:

a support base having provided thereon a magnetic layer having a low coefficient of friction and improved lubricity; and

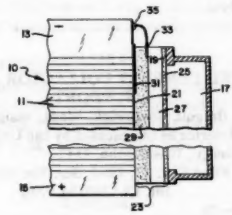
12-oxystearic acid contained within the magnetic layer.

4,548,874

SHORT PROTECTION DEVICE FOR STACK OF ELECTROLYTIC CELLS

Murray Katz, Newington, and Craig R. Schroll, West Hartford, both of Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1984, Ser. No. 676,340
Int. Cl.⁴ H01M *8/24*
U.S. Cl. 429—18 **10 Claims**



1. An electrical short protection device in combination with a gas seal between a gas supply manifold and a face of an electrolytic cell stack, said stack having opposite ends of negative and positive electrical potential, wherein said gas seal includes a porous sealing medium between marginal portions of the stack face and the manifold, said electrical short protection device comprising:

a generally non-porous electrically insulative shield between the marginal portions of at least two cells in the negative end of the stack and said porous sealing medium; and

an electrically conductive foil of corrosion resistant material electrically coupled to the negative potential of the cell stack, said foil disposed across the thickness of the porous sealing medium from the electrically insulative shield in general alignment therewith, wherein electrolytically dissolved metal ions preferentially migrate to the foil instead of the face of the fuel cell stack.

4,548,875

HEATED TRANSPORTABLE FUEL CELL CARTRIDGES

Joseph R. Lance, N. Huntingdon, and Francis R. Spurrier, Whitehall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

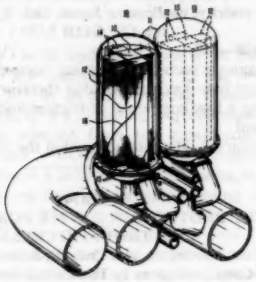
Filed Mar. 27, 1984, Ser. No. 593,220
Int. Cl.⁴ H01M *8/02*
U.S. Cl. 429—26 **9 Claims**

1. A fuel cell cartridge protective system comprising:

(A) a fuel cell cartridge, not in operation, containing a plurality of fuel cell stacks, each stack containing a plurality of fuel cells containing liquid electrolyte therein which is subject to crystallization;

(B) a sealed protective containing vessel attached to and enclosing the fuel cell cartridge; and

(C) electrical heating means attached to a power source, said heating means disposed within the containing vessel and spaced away from the electrolyte containing fuel cell stacks and the containing vessel; said electrical heating



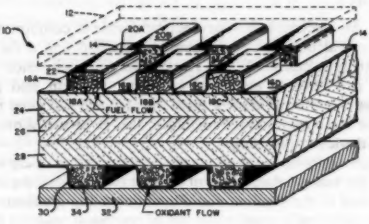
means generating an amount of heat effective to provide an electrolyte temperature over the electrolyte crystallization temperature when the fuel cell cartridge is not in operation, and where said heat is radiated to the fuel cell stacks and then conducted through the stacks to warm the electrolyte.

4,548,876

INTEGRATED CURRENT COLLECTOR AND CATALYST SUPPORT

Lawrence J. Bregoli, Southwick, Mass., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,851
Int. Cl.[4] H01M *4/86*
U.S. Cl. 429—39 **19 Claims**



1. An electrode for use in a gaseous fuel cell wherein a reactant gas is introduced for generating electrical energy, said electrode comprising:

a generally flat, planar catalyst responsive to said reactant gas for effecting the ionization thereof, said catalyst comprised of a first compressed, particulate material;

a current collector positioned immediately adjacent to and in electrical contact with a generally flat surface of said catalyst for carrying an electrical current arising from the ionization of the reactant gas, said current collector including a plurality of elongated, generally linear corrugations therein forming alternating closed and open channels along the flat surface of said catalyst through which the reactant gas is circulated; and

a second particulate material positioned within said gas carrying closed channels along the length thereof for maintaining spacing between said catalyst and said current collector along said closed channels and diffusing the reactant gas into said catalyst.

4,548,877

ELECTROLYTE RESERVOIR FOR CARBONATE FUEL CELLS

Charles D. Iacovangelo, Schenectady, N.Y., and David A. Shores, Minneapolis, Minn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1984, Ser. No. 612,951
Int. Cl.[4] H01M *4/88, 8/14*
U.S. Cl. 429—41 **20 Claims**

1. An electrode for a carbonate fuel cell comprising an electrode-active material with a plurality of discrete portions of electrolyte dispersed therein, wherein the electrolyte is stored in porous ceramic particles uniformly mixed with said electrode-active material.

4,548,878

ELECTROCHEMICAL CELL AND METHOD OF PASSIVATING SAME

Arnold Z. Gordon, Lyndhurst, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 11, 1985, Ser. No. 710,607
Int. Cl.[4] H01M *2/32, 6/50*
U.S. Cl. 429—50 **24 Claims**

1. An electrochemical cell comprising a reactive metal anode, a cathode spaced from said anode to define a reaction space, an aqueous alkaline electrolyte with which said anode and said cathode are in contact during operation of said cell, a supply of a shutdown liquid, and means adapted to introduce said liquid to said cell to at least partially displace said electrolyte and at least partially passivate said cell, said liquid comprising an ethylenically saturated organic polymer having a molecular weight of about 100 to 1,000 Daltons, said liquid being at least partially miscible with said electrolyte and containing a plurality of ether linkages, wherein the atomic ratio of carbon present in the polymer to the oxygen present in the ether linkages is in the range of about 1:1 to 5:1, said polymer being substantially chemically inert with respect to said anode, said cathode and said electrolyte.

4,548,879

SOLDERABLE POLYMER THICK FILMS

Frank St. John, Patterson, and Wayne Martin, Baldwin Place, both of N.Y., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 21, 1984, Ser. No. 612,184
Int. Cl.[4] H01B *1/00*
U.S. Cl. 427—96 **27 Claims**

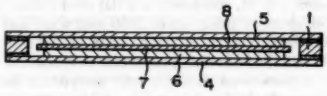
1. A conductive composition having improved solderability comprising metal comprising nickel, coated with saturated monocarboxylic acid, and dispersed in an organic polymeric matrix.

4,548,880

FLAT CELL

Shintaro Suzuki, Ebina; Hirotsugu Fujita, Yono; Yoshiaki Asami, and Fumiko Homma, both of Tokyo, all of Japan, assignors to Toshiba Battery Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,186
Claims priority, application Japan, Jan. 18, 1984, 59-6934
Int. Cl.[4] H01M *6/12*
U.S. Cl. 429—162 **3 Claims**



1. A flat cell electrical power source comprising a non aque-

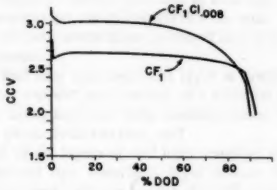
ous electrolye, a positive electrode metal plate, a negative electrode metal plate confronted with said positive electrode metal plate, and an adhesive sealing member for sealing the peripheral edge portions of said metal plates, characterized in that said sealing member has a three-layer structure in which ionomer resin pieces are disposed on the opposite sides of a polyethylene piece or an ethylene copolymer piece.

4,548,881

HIGH ENERGY DENSITY BATTERY WITH CATHODE COMPOSITION

David Nalewajek, West Seneca; Richard E. Eibeck, Orchard Park, and Bernard Sukornick, Williamsville, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 8, 1985, Ser. No. 699,765
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **16 Claims**



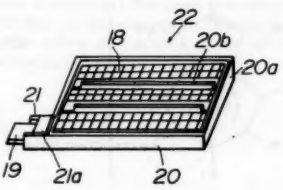
1. A high energy density battery comprising (a) a negative electrode having as the active material an electrochemically active metal; (b) a non-aqueous liquid electrolyte; and (c) a positive electrode the improvement which comprises: a positive electrode (c) having as its principal active material a chlorofluorinated carbon represented by the formula $(C_yF_xCl_2)_n$ wherein y ranges from 1 to 2, x is greater than 0 and up to 1.2, z is at least 0.001 and ranges up to 0.1 and n is the number of repeating units in the range of $1 \leqq n > > 10^5$.

4,548,882

STORAGE BATTERY PLATE-GRID AND RETAINER CONSTRUCTION

Toshiaki Shima, Osaka; Naozi Hamamuro, Nabari; Shinichi Ikari, Kumagaya, and Tuneo Fuzishiro, Nabari, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Division of Ser. No. 310,049, Oct. 9, 1981, Pat. No. 4,499,929. This application Apr. 5, 1984, Ser. No. 582,954
Int. Cl.[4] H01M *4/73*
U.S. Cl. 429—211 **4 Claims**



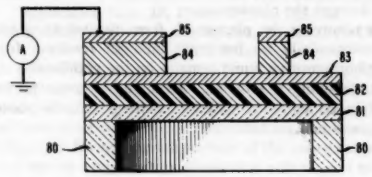
1. A plate for a storage battery, comprising in combination:
a unitary metal plate grid;
a unitary frame of plastic surrounding said plate grid, said unitary frame having a peripheral wall and plural longitudinal members each having portions thereof exposed on each side of said plate grid;
a paste of electrochemically active material filling said plate grid on both sides and filling said plastic frame;
a fiber mat adhered to said exposed portions on each side of said frame means; and
said plastic and said fiber mat being resistant to the electrolyte of a storage battery.

4,548,883

CORRECTION OF LITHOGRAPHIC MASKS

Alfred Wagner, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 31, 1983, Ser. No. 499,774
Int. Cl.[4] G03F *9/00*
U.S. Cl. 430—5 **6 Claims**



1. A method of correcting an X-ray shadow mask that comprises a pattern of a material that is substantially opaque to X-ray radiation,
CHARACTERIZED BY
depositing on said pattern a layer of a material having a relatively low sputter yield as compared to that of said pattern, and thereafter directing an ion beam at an opaque defect on said mask, whereby said defect is removed.

4,548,884

REGISTERING AND EXPOSING SHEET SUBSTRATES USING PHOTOSENSITIVE LIQUID

Robert B. Heiart, Middletown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 387,535, Jun. 11, 1982, abandoned. This application May 22, 1984, Ser. No. 612,862
Int. Cl.[4] G03F *9/00*; G03C *5/00*
U.S. Cl. 430—22 **25 Claims**

1. A process of imagewise exposure to actinic radiation of a photosensitive layer applied to a sheet substrate with registration of a photomask to the substrate comprising the steps of:
(1) advancing a planar sheet substrate to a position in a device to undertake in either order or concurrently
(a) aligning the substrate and a flexible photomask in a predetermined hinged relationship to one another;
(b) applying a photosensitive liquid between the substrate and the photomask with said liquid applied in excess

compared to the amount necessary to form a layer in step (2);

(2) contacting through the photosensitive liquid the substrate maintained in a planar configuration and the photomask by advancing line pressure whereby during said contacting substantially no movement of the photomask occurs relative to the substrate other than a more intimate contact due to displacement of the photosensitive liquid in a liquid layer whereby excess liquid is squeezed from an interface between the substrate and the photomask to form a photosensitive layer and whereby at least one of interfacial or viscous force aids in holding the substrate and photomask in a fixed position relative to one another without a gap present formed by a gas or vapor intermediate layer;

(3) exposing the photosensitive liquid to actinic radiation through the photomask;

(4) removing the photomask from the substrate whereby substantially no hardened material resulting from the photosensitive liquid remains on the photomask;

(5) obtaining a substrate containing discrete portions of bonded hardened material resulting from the photosensitive liquid.

4,548,885

PROCESS FOR USING A FLEXIBLE LAMINATABLE PHOTOSENSITIVE LAYER IN THE PRODUCTION OF A PRINTED CIRCUIT

Alfred Brechlin, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 275,712, Jun. 22, 1981, Pat. No. 4,492,747. This application Oct. 24, 1984, Ser. No. 664,427

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024772

Int. Cl.⁴ G03G *5/06, 13/26*

U.S. Cl. 430—49 **3 Claims**

1. A process for the production of a printed circuit board or an etched part, comprising the steps of:

applying to a metallic or metallized conductive layer provided on a flexible support member a flexible photosensitive layer having a thickness greater than about 15 microns and comprising a substantially organic photoconductor, at least one of at sensitizer and an activator, and a binder comprising at least one copolymer formed by copolymerizing monomers comprised of an alkyl methacrylate having 6 carbon atoms in the alkyl group and an acid component selected from acrylic acid and a mixture of acrylic acid and methacrylic acid, said copolymer having an acid number in the range from about 90 to about 250, wherein the proportion by weight of said methacrylic acid to said acrylic acid is between about 0:1 and 2:1;

charging the photosensitive layer;

exposing the photosensitive layer imagewise to an original to produce a latent charge image on non-exposed areas of the layer;

masking the latent charge image by applying toner thereto, whereby image areas of the photosensitive layer are covered by the toner;

decoating non-image areas of the photosensitive layer by applying an aqueous alkaline solution to remove portion of the photosensitive layer not covered by the toner; and

chemically treating the decoated photosensitive layer to provide a conductive layer in one of the image or the non-image areas.

4,548,886

RADIATION SENSITIVE ORGANIC THIN FILM COMPRISING AN AZULENIUM SALT

Kazuharu Katagiri; Yoshihiro Oguchi, both of Yokohama, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,978

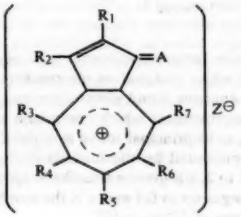
Claims priority, application Japan, Jun. 8, 1982, 57-98047; Sep. 13, 1982, 57-160156; Sep. 13, 1982, 57-160157; Sep. 22, 1982, 57-165263; Jan. 17, 1983, 58-6070; Jan. 20, 1983, 58-7523

Int. Cl.⁴ G03G *5/06*

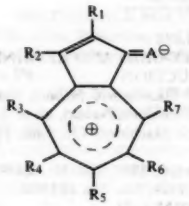
U.S. Cl. 430—70 **34 Claims**

1. A radiation-sensitive organic thin film comprising a radiation-sensitive compound having at least one nucleus of an azulenium salt; said compound represented by the following general formula I, II or III:

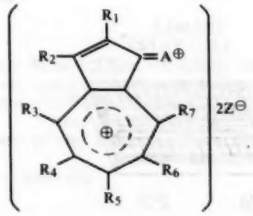
(I)



(II)



(III)



wherein; each of R_1, R_2, R_3, R_4, R_5, R_6, and R_7 is hydrogen, halogen, or an organic monovalent residue, where at least one of the combinations (R_1 and R_2), (R_3 and R_4), (R_4 and R_5), (R_5 and R_6), and (R_6 and R_7) may form a substituted or unsubstituted aromatic ring; A is an organic divalent residue attached through a double bond to the azulenium nucleus; and $Z^{\ominus}$ is an anion residue.

4,548,887

DYE DIFFUSION TRANSFER PROCESS WHEREIN PROTEOLYTIC ENZYME DECOMPOSES LIGHT SENSITIVE ELEMENT

Günter Helling, Odenthal, and Wolfgang Himmelmann, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,557

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325762

Int. Cl.[4] G03C 5/54, 1/40, 7/26

U.S. Cl. 430—213 8 Claims

6. A colour photographic recording material for the production of colour images by the dye diffusion transfer process, consisting of a layer support and, arranged thereon, a combination of layers comprising

at least a first dye absorbent layer capable of being coloured by diffusible dyes, and

detachably connected with this dye absorbent layer, a light-sensitive element having at least one spectrally sensitized silver halide emulsion layer and at least one colour-providing compound associated therewith, and

a second dye absorbent layer arranged above the light-sensitive element,

wherein said first dye absorbent layer is firmly attached to the layer support and consists of a material which is subject to comparatively little decomposition by treatment with a proteolytic enzyme, and

the binder of the layers of said light-sensitive element and of said second dye absorbent layer consist of a material which is comparatively readily decomposed by treatment with the same enzyme, and

wherein said second dye absorbent layer has less mordanting capacity than said first dye absorbent layer.

4,548,888

PHOTOGRAPHIC PRODUCTS EMPLOYING NOVEL NONDIFFUSIBLE HYDRAZONE DYE-RELEASING COMPOUNDS

Michael W. Crawley, Watford, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1984, Ser. No. 669,144

Claims priority, application United Kingdom, Dec. 20, 1983, 8333830

Int. Cl.[4] G03C 1/40, 5/54

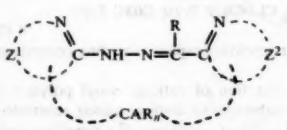
U.S. Cl. 430—223 24 Claims

12. In a photographic assemblage comprising:

(i) a support having thereon at least one photosensitive silver hailde emulsion layer having associated therewith a dye image-providing material;

(ii) a dye image-receiving layer; and

(iii) an alkaline processing composition and means containing same for discharge within said assemblage; said assemblage containing a silver halide developing agent; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible yellow dye moiety or precursor thereof having the formula:



wherein:

(a) Z^1 and Z^2 each independently represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic ring;

(b) CAR represents a ballasted carrier moiety capable of releasing said diffusible yellow dye moiety or precursor thereof as a function of development of said silver halide emulsion layer under alkaline conditions;

(c) R represents hydrogen, an alkyl or substituted alkyl group of from 1 to about 12 carbon atoms, an aryl or substituted aryl group of from about 6 to about 12 carbon atoms, a substituted or unsubstituted 5- or 6-membered aromatic heterocyclic ring, or CAR; and

(d) n is 0, 1 or 2, with the proviso that when n is 0, then R is CAR.

4,548,889

OPTICAL RECORDING MEDIUM

Yuhei Nemoto, Tokyo; Sadaaki Shigeta, Narashino, and Yoshio Yokokawa, Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 456,809, Jan. 10, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,758

Claims priority, application Japan, Jan. 12, 1982, 57-2309

Int. Cl.[4] G03C 5/24

U.S. Cl. 430—273 14 Claims

1. An optical recording medium composed of a substrate, an energy-sensitive layer which is a film or sheet of an organic material formed on one surface of the substrate, and an energy-absorbing layer formed on the surface of the energy-sensitive layer and having a high energy absorption with respect to light having a wavelength of 750 to 850 nm, said-absorbing layer being a film composed of a matrix of a metal oxide and fine particles of a metal dispersed in said matrix, said metal oxide being at least one compound selected from the group consisting of MoO_{3-x}, WO_{3-x}, M_xMoO_3, M_xWO_3 and $M_xMo_{1-y}W_yO_3$ wherein x is a positive number of not more than 0.5, y is a positive number of not more than 1, and M represents a metal element of Group I or II of the periodic table, said metal being at least one of copper, silver and gold, and the volume fraction of the fine metal particles in the energy-absorbing layer being from 0.2 to 0.8.

4,548,890

WATER-BASED PHOTOPOLYMERIZABLE COMPOSITIONS AND THEIR USE

Peter Dickinson, and Michael Ellwood, both of Broadstairs, England, assignors to Sericol Group Limited, London, England

Filed Mar. 30, 1984, Ser. No. 595,448

Claims priority, application United Kingdom, Mar. 31, 1983, 8309019

Int. Cl.[4] G03C 1/68

U.S. Cl. 430—280 17 Claims

1. A composition in the form of an aqueous dispersion comprising water, at least one dispersed cationically curable epoxy resin, a water-soluble colloid, and a photosensitive sulphonium or iodonium salt capable on exposure to actinic radiation of effecting cationic polymerisation and thus insolubilization of the said epoxy resin.

4,548,891

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING PREPOLYMERS WITH OLEFIN DOUBLE BONDS AND TITANIUM METALLOCENE PHOTOINITIATORS

Martin Riediker, Riehen; Ottmar Rohde, Basel; Martin Roth, Giffers, and Niklaus Bühler, Marly, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,519

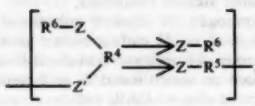
Claims priority, application Switzerland, Feb. 11, 1983, 785/83

Int. Cl.[4] G03C 1/70, 5/16

U.S. Cl. 430—283 21 Claims

1. A photopolymerizable composition which comprises,

(a) a prepolymer which contains identical or different recurring structural units of the formula I

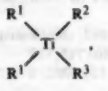


(I)

and which reacts, when heated, to form a thermostable ring structure, and

(b) a photoinitiator,

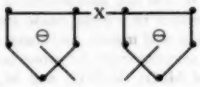
wherein the photoinitiator (b) is a metallocene of the formula II



(II)

wherein

R^1 is each independently unsubstituted or substituted cyclopentadienyl$^{\ominus}$, indenyl$^{\ominus}$, or both symbols R^1 together are an unsubstituted or substituted radical of the formula III



(III)

R^2 is a carbocyclic or 5- or 6-membered heterocyclic aromatic ring which is substituted in at least one of the two ortho-positions relative to the metal-carbon bond by a fluorine atom,

R^3 is C_3-C_5alkynyl, substituted or unsubstituted phenylalkynyl containing 3 to 5 carbon atoms in the alkynyl moiety, N_3, CN, $Si(R^7)_3$ or $Sn(R^7)_3$, or has the meaning of R^2, or R^2 and R^3 together are a radical of the formula IV

—Q—Y—Q— (IV),

R^4 is a tetravalent aromatic radical after removal of four functional groups, with any two functional groups being adjacent and→denoting structural isomers,

R^5 is a divalent aliphatic, cycloaliphatic or monocyclic or polycyclic aromatic radical, or aromatic radicals which contain a —$CONH_2$ or —COOH group in the ortho-position to the bond to Z',

R^6 is a radical containing a photopolymerisable olefinic double bond,

R^7 is C_1-C_{12}alkyl, C_5-C_{12}cycloalkyl, C_6-C_{16}aryl or C_7-C_{16}aralkyl,

Z is —COO—, —CONH—, —O—, —NH—, —COOH/$NR^{14}R^{15}$— or

wherein/between amine and carboxyl groups denotes as ionic bond,

Z' is —CONH—, —NHCO—, —NH—CO—NH— or —O—CO—NH—, and each of R^{14} and R^{15} is independently alkyl or alkenyl each having up to 6 carbon atoms, with the proviso that, on heating the photopolymerisable composition to remove the radical R^6, either Z and Z', or Z and Z' together with —$CONH_2$ or —COOH groups contained in R^5, form a thermostable ring system,

X is $(CH_2)_n$, in which n is 1, 2 or 3, C_2-C_{12}alkylidene, cycloalkylidene containing 5 to 7 ring carbon atoms, $Si(R^7)_2$ or $Sn(R^7)_2$,

Q is a carbocyclic or heterocyclic 5- or 6-membered aromatic ring, each of the two bonds being in the ortho-position to the group Y and each meta-position to the group Y being substituted by a fluorine atom, and Q may contain further substituents, and Y is CH_2, C_2-C_{12}alkylidene, cycloalkylidene containing 5 to 7 ring carbon atoms, a direct bond, NR^7, O, S, SO, SO_2, CO, $Si(R^7)_2$ or $Sn(R^7)_2$.

21. A process for the production of relief images on substrates, which comprises coating a substrate with a photopolymerisable composition according to claim **1** and exposing said layer imagewise, removing the unexposed parts with a solent and subsequently fixing the resultant image by baking to give an image which is resistant to high temperatures.

4,548,892

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING ACYLHALOACETIC ACID AMIDE DERIVATIVES

Masayuki Iwasaki; Minoru Maeda; Fumiaki Shinozaki, all of Shizuoka, and Kouichi Kawamura, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

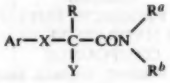
Filed Jan. 29, 1985, Ser. No. 696,214

Claims priority, application Japan, Jan. 30, 1984, 59-14819

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—288 **17 Claims**

1. A photopolymerizable composition containing an addition polymerizable unsaturated compound having two or more ethylenically unsaturated double bonds within the molecule and a photopolymerization initiator, wherein said photopolymerization initiator is an acylhaloacetic acid amide derivative represented by formula (I)



(I)

wherein Ar represents a substituted or unsubstituted aryl group, X represents a carbonyl or sulfonyl group, Y represents a chlorine atom or a bromine atom, R represents a hydrogen atom, a chlorine atom, or a bromine atom, and R^a and R^b each represents a hydrogen atom, a substituted or unsubstituted alkyl group, an aryl group, or an aralkyl group.

4,548,893

HIGH RESOLUTION LITHOGRAPHIC RESIST AND METHOD

Kang I. Lee, Framingham; William Jensen, Waltham, and Peter Cukor, Natick, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

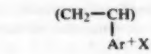
Division of Ser. No. 481,611, Apr. 4, 1983, Pat. No. 4,456,678, which is a continuation-in-part of Ser. No. 255,936, Apr. 20, 1981, abandoned. This application May 11, 1984, Ser. No. 609,163

Int. Cl.[4] G03F *7/10*; **G03G** *5/16*

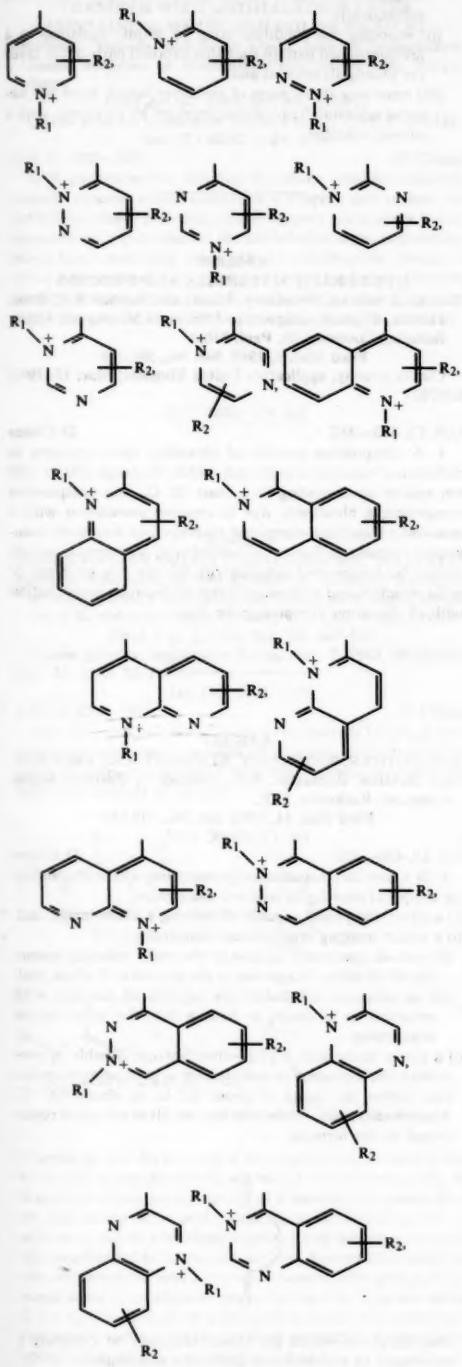
U.S. Cl. 430—296 **6 Claims**

1. A method of microlithographic recording comprising the steps of

(a) applying a thin film of cationic vinyl polymer resist material to a substrate to form a coated substrate, said cationic vinyl polymer consisting of a repeating unit



wherein Ar^+ is selected from the group consisting of:



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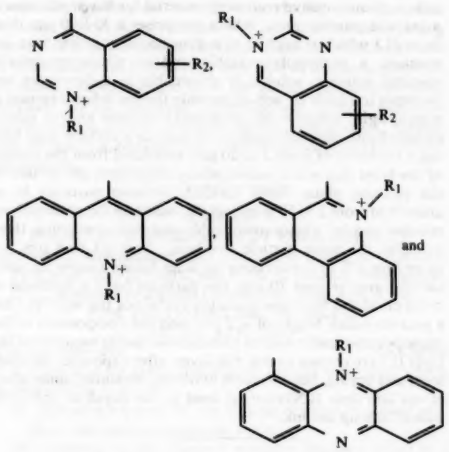


wherein R_1 is selected from the group consisting of hydrogen, and C_1 to C_{12} branched and unbranched alkyl radicals, R_2 is selected from the group consisting of hydrogen and C_1 to C_4 branched and unbranched alkyl radicals, and X^- is selected from the group consisting of F^-, Cl^-, Br^-, I^-, and PF_6^-, said polymer having an average molecular weight from about 5,000 to about 100,000, and said polymer being converted by actinic radiation from a charged form soluble in solvents of high dipole moment to an uncharged form insoluble in solvents of high dipole moment;

(b) exposing said thin film of cationic polymer resist material of the coated substrate to actinic radiation so as to form a pattern of exposed regions and unexposed regions in said thin film, the cationic polymer resist material of the exposed regions being converted by said actinic radiation from a charged form soluble in solvents of high dipole moment to an uncharged form insoluble in solvents of high dipole moment;

(c) washing the coated substrate having said pattern of exposed regions and unexposed regions in said thin film in a solvent of high dipole moment to remove the cationic polymer resist material of the unexposed regions from the coated substrate;

(d) patterning the washed substrate by utilizing the cationic polymer resist material of the exposed regions as a protective mask to pattern the substrate; and

(e) removing any remaining cationic polymer film from said substrate.

2. A method for microlithographic recording in accordance with claim **1** wherein said step of exposing comprises exposing said thin film of cationic polymer resist material to a directed electron beam to produce said pattern of exposed regions and unexposed regions in said thin film.

4,548,894

PHOTOSENSITIVE RECORDING MATERIALS FOR THE PRODUCTION OF ABRASION-RESISTANT AND SCRATCH-RESISTANT GRAVURE PRINTING PLATES COMPRISING PARTICLES

John Lynch, Monsheim, and Albert Elzer, Otterstadt, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 400,136, Jul. 20, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,429

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128949

Int. Cl.[4] G03C *1/68, 1/71;* **G03F** *7/10*

U.S. Cl. 430—273 **7 Claims**

1. A photosensitive recording material for the production of a gravure printing plate, which comprises a 30–500 μm thick layer (L) which is applied to a dimensionally stable base and contains a photopolymerizable and/or photocrosslinkable material which is soluble or dispersible in a developer and becomes insoluble or non-dispersible therein when exposed to actinic light, wherein the photopolymerizable and/or photocrosslinkable material contains, at least in a surface zone having a thickness of from 1 to 50 μm, measured from the surface of the layer (L), which subsequently constitutes the surface of the printing plate, finely divided, abrasive particles in an amount of from 2 to 50% by weight, based on the photopolymerizable and/or photocrosslinkable material containing these particles, the mean particle size being from 0.1 to 6 μm, not more than 5% of the abrasive particles have a maximum particle size greater than 10 μm, the particles have a hardness of >4.0 on Mohs' hardness scale, the surface of the layer (L) has a peak-to-valley height of <2 μm, and the components of the photopolymerizable and/or photocrosslinkable material of the layer (L) are chosen so that this layer, after exposure, development and drying, has a Vickers hardness, measured under load, of not less than 10N/mm^2, at least to the depth of the wells which take up the ink.

4,548,895

PROCESS FOR THE PRODUCTION OF IMAGES USING A HEATING STEP PRIOR TO IMAGING

Edward Irving, Burwell, and Terence J. Smith, Royston, both of England, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Mar. 7, 1984, Ser. No. 586,897

Claims priority, application United Kingdom, Mar. 16, 1983, 8307220

Int. Cl.[4] G03C *5/00*

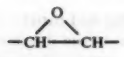
U.S. Cl. 430—325 **18 Claims**

1. A process for the production of an image comprising

(i) heating at a temperature of at least 80° C. a layer, supported on a carrier, of a liquid composition consisting essentially of

(A) 1 to 10 parts per 100 parts of light sensitive compound or mixture of a heat-activated latent polymerizing agent for 1,2-epoxides with

(B) a light-sensitive compound having in the same molecule at least one 1,2-epoxide group of formula



I

and at least one unsaturated ester group of formula

$$CH_2=C(R^1)COO-$$ II

where R^1 is a hydrogen, chlorine, or bromine atom or an alkyl group of 1 to 4 carbon atoms, or with a mixture of

(C) a compound containing at least one 1,2-epoxide group of formula I absent the unsaturated ester group of formula II, together with

(D) a compound containing at least one unsaturated ester group of formula II absent the 1,2-epoxide group of formula I, or with a mixture of compound (B) and a compound (C) and/or a compound (D), such that the layer solidifies through thermal polymerization and becomes essentially non-tacky but remains photopolymerizable and subsequently

(ii) exposing the solidified layer to actinic radiation in a predetermined pattern such that exposed parts of the layer are photopolymerized and

(iii) removing those parts of the layer which have not become substantially photopolymerized by treatment with a solvent therefor.

4,548,896

DYE-BLEACH MATERIALS AND PROCESS

Gebran J. Sabongi, Woodbury, Minn., and Stephen S. C. Poon, Harlow, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 6, 1984, Ser. No. 586,770

Claims priority, application United Kingdom, Mar. 15, 1983, 8307021

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—332 **25 Claims**

1. A composition capable of bleaching upon exposure to radiation of selected wavelength within the range 200 to 1100 nm and/or upon heating to at least 70° C., said composition comprising a bleachable dye in reactive association with a mesoionic bleaching compound wherein said mesoionic compound contains a five- or six-membered heterocycle which cannot be represented satisfactorily by any one covalent or polar structure and possesses a sextet of electrons in association with all the atoms comprising the ring.

4,548,897

PHOTOTHERMOGRAPHIC ELEMENT AND PROCESS

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1984, Ser. No. 615,615

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—351 **11 Claims**

1. In a heat developable image recording element comprising a support bearing, in reactive association,

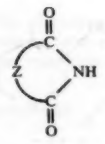
(a) a silver compound capable of forming a silver image, and

(b) a cobalt imaging combination comprising

(i) a cobalt compound capable of thermally releasing ammonia or an amine imagewise in the presence of silver, and

(ii) an aromatic 1,2-dialdehyde capable of reacting with ammonia or an amine to form a dye, the improvement comprising

(c) a cyclic imide melt former-silver solvent capable of promoting dye formation in said element at processing temperature within the range of about 80° C. to about 200° C. wherein said cyclic imide melt former-silver solvent is represented by the formula:



wherein Z represents the atoms necessary to complete a substituted or unsubstituted hydantoin compound.

4,548,898

PHOTOSENSITIVE MATERIAL FOR DIFFUSION TRANSFER WITH ANTIHALATION LAYER CONTAINING WHITE AND COLOR PIGMENT

Motoshige Yamada, and Seigo Ebato, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,527
Claims priority, application Japan, Jul. 27, 1982, 57-131521
Int. Cl.[4] G03C *1/84, 5/54*
U.S. Cl. 430—510 10 Claims

1. A photosensitive material for silver complex diffusion transfer process which comprises a support and at least an antihalation layer provided on the support and a silver halide emulsion layer provided on the antihalation layer, said antihalation layer consisting essentially of a hydrophilic binder, a white pigment and a color pigment, and having a reflection density of about 0.1 to about 0.3 and weight ratio of the total pigment to the hydrophilic binder being about 1 to about 10.

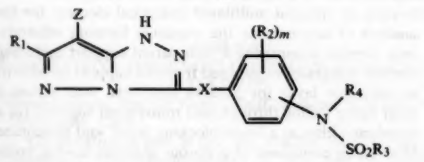
4,548,899

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

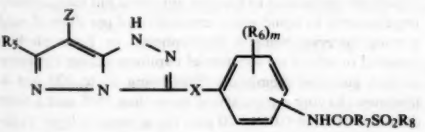
Noritaka Nakayama; Satoshi Kawakatsu; Katsunori Katoh, all of Hachioji, and Kaoru Shinozaki, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,465
Claims priority, application Japan, Nov. 2, 1983, 58-206321; Nov. 15, 1983, 58-214853
Int. Cl.[4] G03C *7/26*
U.S. Cl. 430—558 17 Claims

1. A silver halide color photographic material having at least one silver halide emulsion layer on a support, said silver halide emulsion layer containing at least one magenta coupler of the following formula (I) or (II):



(I)



(II)

wherein R_1 and R_4 are each a hydrogen atom, an alkyl group or an aryl group; R_2 and R_6 are each a monovalent group; R_3 is an alkyl group, an aryl group or a heterocyclic group; R_5 is an alkyl group or an aryl group; R_7 is an alkylene group, an arylene group or a bivalent organic group having at least one alkylene bonded to at least one arylene; R_8 is an alkyl group, an alkenyl group, an aryl group or a heterocyclic group; X is a single bond or an alkylene group having 1 to 5 carbon atoms; Z is a hydrogen atom or a group that can be eliminated upon coupling reaction with the oxidized product of a color developing agent; and m is an integer of 0 to 4.

4,548,900

METHOD OF INTERFERON PRODUCTION

Masahiro Nobuhara, Iwatsuki; Kiyoshi Yamaguchi, Kawaguchi, and Ei Mochida, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,506
Claims priority, application Japan, May 31, 1982, 57-92583
Int. Cl.[4] C12P *21/00;* C12N *5/00, 5/02;* C12R *1/91*
U.S. Cl. 435—68 25 Claims

1. In a method for producing interferon by culturing interferon-producing cells in a medium in the presence of an interferon inducer under conditions suitable for the formation of interferon and recovering the interferon, the improvement comprising treating said interferon-producing cells at a priming stage in a priming medium with an interferon stimulating amount of a water soluble polyhydric alcohol which has two or more alcoholic hydroxyl groups, said at least one polyhydric alcohol being selected from the group consisting of polyethylene glycol, diol-type polypropylene glycol, triol-type polypropylene glycol, ethylene glycol, propanediol, butanediol, butanetriol, butanetetrol, pentanediol, pentaerythritol and hexanetriol.

4,548,901

PLANTLET GENERATION BY CELL CULTURE

Michael L. Christianson, San Francisco; Debra A. Warnick, Palo Alto, both of Calif., and Peter S. Carlson, Washington, D.C., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Jun. 21, 1983, Ser. No. 506,476
Int. Cl.[4] A01G *1/00*
U.S. Cl. 435—241 16 Claims

1. A method for generating legume bipolar embryoids which comprises the steps of:

(a) culturing explants of the legume embryo in a basal medium containing exogenous auxin;

(b) culturing of the cultured explants obtained in (a) in a basal medium containing exogenous auxin in a lower concentration than in (a);

(c) culturing of the cultured explants obtained in (b) in a basal medium containing exogenous auxin and an ammonium salt, said medium being free of nitrate anion;

(d) transfer of the cultured explants obtained in (c) into an aqueous liquid suspension medium containing exogenous auxin and an ammonium salt, said medium being free of nitrate anion, and mildly agitating the medium so as to maintain the cultured explants in suspension; and

(e) transfer of an aggregate of cells obtained in suspension in (d) to an expression medium containing exogenous auxin and allowing said aggregate to form a bipolar embryoid.

4,548,902

METHOD FOR DETERMINING THE COMPATIBILITY OF A DIRECT OR REACTIVE DYESTUFF WITH A POLYBASIC AMINO COMPOUND

Rolf Hasler, Oberwil, Switzerland, and Francis Palacin, Riedisheim, France, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 347,137, Feb. 9, 1982, abandoned. This application Jun. 1, 1983, Ser. No. 499,991
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105405
Int. Cl.[4] G01N *21/82, 31/02*
U.S. Cl. 436—2 18 Claims

1. A method for determining the combined suitability of a direct or reactive dyestuff and a polybasic amino compound for use in dyeing or printing a cellulosic substrate and in the preparation of an aftertreatment agent for improving the wetfastness of the resulting dyeing or printing, said method comprising the steps of

(A) mixing an aqueous solution of said direct or reactive dyestuff with an aqueous solution of said polybasic amino compound to form a precipitate;

(B) introducing the precipitate from step (A) into an aqueous alkali solution having a pH≧12 at room temperature, and

(C) observing whether the precipitate introduced in step (B) dissolves in the aqueous alkali solution, said combination being suitable if the precipitate does not dissolve in said aqueous alkali solution.

4,548,903

METHOD TO REVEAL MICROSTRUCTURES IN SINGLE PHASE ALLOYS

Isaac Weiss, Dayton; Francis H. Froes, Xenia, and Daniel Eylon, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,153
Int. Cl.⁴ G01N *21/88, 33/20*
U.S. Cl. 436—5 **6 Claims**

1. A method for revealing the microstructure of metal alloys to permit the observation of both deformed and recrystallized grains on the same metal surface which comprises the steps of polishing a surface of a metal sample, chemically etching the polished metal surface, thermally etching the resulting chemically etched surface and quenching the thermally etched sample.

4,548,904

PROTEIN SEQUENCING METHOD

Stephen B. H. Kent, and James J. L'Italien, both of Edina, Minn., assignors to Molecular Genetics Research & Development, Minnetonka, Minn.

Filed Dec. 3, 1982, Ser. No. 446,579
Int. Cl.⁴ G01N *33/68*
U.S. Cl. 436—89 **7 Claims**

1. A method for the determination of the identity of a terminal amino acid of a polypeptide which comprises:

(a) reacting a terminal amino acid of a polypeptide with a composition of matter which comprises D-C-B-A reagent to form a reagent-derivatized terminal amino acid, wherein A is a moiety which can react with and bind to a terminal amino acid of a polypeptide molecule and can result in removal of the terminal amino acid; B is a moiety which provides steric separation between C and A; C is a nucleophilic moiety selected from the group consisting of —NH—, —S— or —O— which can be detected directly or which can be derivatized with a group that can be detected; and D is a moiety which protects the C moiety from degradation or other modification, and which is labile in acidic media and stable in neutral or basic media;

(b) causing the reagent-derivatized terminal amino acid to cleave from the polypeptide to form a cleaved DCBA reagent-derivatized amino acid;

(c) chemically removing the D moiety from the cleaved DCBA reagent-derivatized amino acid by acidification thereof; and

(d) detecting the presence of the C moiety on the CBA reagent-derivatized amino acid.

4,548,905

REAGENT COMPOSITION, DRY ELEMENT AND METHOD FOR DETERMINATION OF TOTAL BILIRUBIN

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,881
Int. Cl.⁴ G01N *33/52, 33/72*
U.S. Cl. 436—97 **20 Claims**

17. A method for determination of total bilirubin in an aqueous liquid, said method comprising the steps of:

(A physically contacting a sample of said liquid with a reagent composition comprising:

a diazonium salt or reagents capable of producing said salt when contacted with water; and 3,3-dimethylglutaric acid or a salt thereof present in an amount effective to buffer said composition at a pH of 3.5 or less when contacted with a 2 μL sample of pooled human serum; and

(B) colorimetrically measuring the amount of azobilirubin formed as a result of said contact.

4,548,906

INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR THE ANALYSIS OF AMMONIA OR AN AMMONIA FORMING SUBSTRATE AND A METHOD FOR THE DETECTION THEREOF USING THE SAME

Nobuyoshi Sekikawa; Harumi Katsuyama, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Japan

Continuation of Ser. No. 437,477, Oct. 28, 1982, abandoned. This application May 11, 1984, Ser. No. 609,291
Claims priority, application Japan, Nov. 2, 1981, 56-176275
Int. Cl.⁴ C12Q *1/58;* G01N *33/52, 33/62, 33/70*
U.S. Cl. 436—113 **6 Claims**

6. A method for the detection of ammonia or an ammonia forming substrate in a liquid sample, which comprises:

providing an integral multilayer analytical element for the analysis of ammonia or the ammonia forming substrate, said element comprising a transparent support including thereon integrally superposed from the support upward (i) an indicator layer for gaseous ammonia, said indicator layer being visible through said transparent support, (ii) a membrane filter as a liquid blocking layer, said membrane filter being composed of a porous material having voids which are permeable to gaseous ammonia but substantially impermeable to liquid under conditions of use thereof, said porous material being a hydrophobic or hydrophobed material in which no substantial capillary action by water occurs, and said membrane filter being 30 to 300 μm in thickness, having a porosity of more than 25% and a pore diameter of from 0.01 to 20 μm, (iii) a reagent layer comprising a water soluble binder and a reagent which may react with the substrate to form ammonia and, (iv) a spreading layer, the adhesive strength between said membrane filter and said reagent layer being sufficient to provide an integral unit,

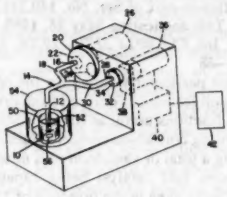
spotting said sample on said spreading layer of said element, and

measuring visually or photometrically through the transparent support the development or fading of color in the indicator layer resulting from the reaction between the indicator and ammonia which was formed in the reagent layer and passed through the liquid blocking layer.

4,548,907
FLUORESCENT FLUID DETERMINATION METHOD AND APPARATUS

William R. Seitz, and Zhang Zhujun, both of Durham, N.H., assignors to Allied Corporation, Morristown, N.Y.

Filed Sep. 14, 1983, Ser. No. 531,957
Int. Cl.[4] G01N *21/64, 21/80*
U.S. Cl. 436—163 18 Claims



15. A method of measuring a characteristic of a sample using an optical pH sensor,

said sensor comprising a multi-wavelength light source, a limited bandwidth light detector, and a pH-sensitive fluorophor, said fluorophor having a first dissociation constant associated with the ground-state dissociation of said fluorophor into a hydrogen ion and the corresponding anion and a second dissociation constant associated with the excited-state dissociation, said second dissociation constant being several orders of magnitude larger than said first dissociation constant,

said method comprising exposing said fluorophor to said sample, measuring the fluoroescence intensity I_{Fa} at an emission wavelength λ_e using the excitation wavelength λ_a of the acid form of the fluorophor, measuring the fluorescence intensity I_{Fb} at said λ_e using the excitation wavelength λ_b of the base form of the fluorophor, and taking the ratio of I_{Fb}/I_{Fa} as a measure of a characteristic of the sample.

4,548,908
COMPETITIVE IMMUNOFLUORESCENCE ASSAY AND TEST KIT

Naomi Kameda, Portola Valley, Calif., assignor to Sclavo, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 376,204, May 7, 1982, abandoned. This application May 27, 1983, Ser. No. 498,864
Claims priority, application PCT Int'l Appl., May 6, 1983, PCT/US83/00675
Int. Cl.[4] G01N *33/52, 33/58;* B65D *71/00*
U.S. Cl. 436—500 15 Claims

1. A competitive immunofluorescence assay for determining the amount of an antigen in a sample suspected of containing the antigen comprising:

(a) incubating the sample with a solution of a fluorescent-labeled antigen, anti-antigen antibody, and an antibody against the anti-antigen antibody;

(b) adding polyethylene glycol to the incubation mixture in amount effective to form an immunoprecipitate;

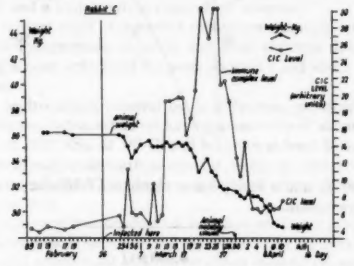
(c) separating the immunoprecipitate and dissolving the immunoprecipitate in a nonfluorescent solvent that has a low ionic strength and maintains the pH of the resulting solution substantially constant; and

(d) measuring the fluorescence intensity of the solution of step (c) and comparing said fluorescence intensity to a standard curve.

4,548,909
METHOD OF DIAGNOSIS

David Parratt, 91 Strathern Rd., Dundee DD5 1JT, Scotland

PCT No. PCT/GB81/00232, § 371 Date Jun. 11, 1982, § 102(e) Date Jun. 11, 1982, PCT Pub. No. WO82/01593, PCT Pub. Date May 13, 1982
PCT Filed Oct. 23, 1981, Ser. No. 395,078
Claims priority, application United Kingdom, Oct. 24, 1980, 8034401
Int. Cl.[4] G01N *33/54*
U.S. Cl. 436—507 10 Claims



1. A method of identifying the presence or absence of an infected state in a living body before the appearance of symptoms of the infection, comprising:

(a) obtaining a biological fluid sample from a living body not displaying symptoms of a particular infection;

(b) adding to the sample a material which is known to bind with immune complex characteristic of said particular infection;

(c) adding to samples of the resulting material radiolabelled or enzyme-labelled reagents known to react specifically with antigen portions of different immune complexes, one of which is characteristic of said particular infection,

(d) separating excess of said reagents and

(e) detecting the presence or absence of said label in the residual mixtures thereby to identify the nature of any reacted antigen portion of immune complex characteristic of said particular infection.

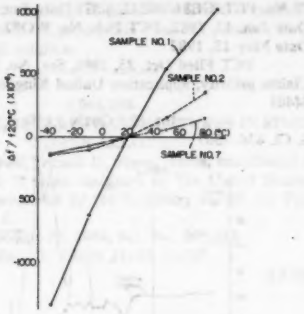
4,548,910
DIELECTRIC CERAMIC OF BAO-TIO_2 AND SNO_2

Naoshi Irisawa, Akita, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 428,709, Sep. 30, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,127
Claims priority, application Japan, Oct. 28, 1981, 56-172481
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—137 3 Claims

1. A dielectric ceramic composition consisting of three components, namely, BaO, TiO_2, and SnO_2, being expressed by the formula $BaO.x\{(1-y)TiO_2.ySnO_2\}$, wherein x is 4.4 mole, and y is from 0.06 to 0.09, and having a mixed crystal structure of $Ba(Ti.Sn)_4O_9$ and $Ba_2(Ti.Sn)_9O_{20}$, said dielectric ceramic com-

position having a resonance frequency coefficient at a temperature of −40° to 80° C. in the range of +3 ppm/°C. to 0



ppm/°C. and a nearly linear resonance frequency temperature characteristic.

4,548,911

REGENERATION OF PHOSPHORUS POISONED AUTOMOTIVE CATALYSTS

Michael J. D'Aniello, Jr., Rochester; David R. Monroe, Bloomfield Hills, and Martin H. Krueger, Roseville, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1984, Ser. No. 661,945

Int. Cl.⁴ B01J *23/96*

U.S. Cl. 502—28 **4 Claims**

1. A method of restoring the activity of an automotive exhaust gas treatment catalyst containing one or more noble metals dispersed on a high surface area carrier where said catalyst has been poisoned by the presence of phosphorus on the surface of the catalyst, said method comprising the sequential steps of;

contacting the catalyst with an aqueous solution of a dibasic organic acid, the amount of solution being at least sufficient to wet and fill the pores of the catalyst, and

thereafter heating the acid wet catalyst in air or in oxygen-containing automotive exhaust gas to remove water and acid.

3. A method of restoring the activity of an automotive exhaust gas treatment catalyst containing one or more noble metals dispersed on a high surface area carrier where said catalyst has been poisoned by the presence of phosphorus on the surface of the catalyst, said method comprising the sequential steps of;

washing the catalyst at least once in a hot, approximately one molar aqueous solution of an acid selected from the group consisting of oxalic acid and malonic acid,

draining off the acid solution, and

thereafter heating the acid wet catalyst in air or in oxygen-containing automotive exhaust gas to remove water and the acid.

4. A method of restoring the activity of an automotive exhaust gas treatment catalyst containing one or more noble metals dispersed on a high surface area carrier where the catalyst has been poisoned by the presence of phosphorus on its surface, said method comprising the sequential steps of;

soaking the catalyst with an approximately one molar aqueous solution of an acid selected from the group consisting of oxalic acid and malonic acid, the amount of solution being just sufficient to wet and fill the pores of the catalyst, and thereafter

heating the acid wet catalyst in flowing air or oxygen-containing automotive exhaust gas whereby the catalyst is dried, the acid is decomposed and removed and phosphorus is redistributed from the surface of the catalyst and the activity of the catalyst to oxidize hydrocarbons and carbon monoxide is increased.

4,548,912

MICROSPHERICAL CATALYSTS

William P. Hettinger, and H. Wayne Beck, both of Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 140,221, Apr. 14, 1980, abandoned. This application May 16, 1983, Ser. No. 494,609

Int. Cl.⁴ B01J *21/16, 29/06, 35/08*

U.S. Cl. 502—68 **11 Claims**

1. A catalyst particularly suited for the conversion of residual hydrocarbon feedstocks derived from crude petroleum into hydrocarbon fractions useful as transportation fuels, said feedstocks comprising conradson carbon values of at least about 2.0 and containing a total of vanadium plus nickel of at least about 6 ppm or more, said catalyst being capable of maintaining substantial activity even in the presence of 2,000 ppm of metals deposited on the catalyst, based on the weight of the regenerated catalyst, said catalyst being regenerable by contact with oxygen-containing gases in a regeneration zone; said catalyst comprising in combination:

A. A hollow microsphere having a shell comprising clay and having a hollow interior which connects with the exterior of said catalyst through at least one feeder pore; and

B. A catalytically active ingredient selected from the group consisting of: a zeolite; platinum on alumina; cobalt molybdena, or nickel on alumina loosely contained within said interior void of said hollow microsphere.

2. A catalyst according to claim 1, wherein said hollow microsphere has a blow hole formed through said shell, said blow hole having a diameter of at least about 5,000 Angstroms.

4,548,913

CATALYST, A PROCESS FOR ITS PREPARATION AND AN ISOMERIZATION PROCESS IN THE PRESENCE OF THIS CATALYST

Wulf Schwerdtel, Leverkusen; Hubert Lauer, Dormagen, and Josef Heinrich, Langenfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,356

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246495

Int. Cl.⁴ B01J *29/28, 21/16*

U.S. Cl. 502—68 **2 Claims**

1. A process for the preparation of an isomerization catalyst which comprises co-molding a crystalline aluminosilicate having a molar ratio of silicon to aluminum of 100–10,000:1 with a kaolinite containing clay mineral and thereafter calcining the resultant molded product at 350°–550° C., said crystalline aluminosilicate containing 0.05 to 2% by-weight fluorine.

2. A process according to claim 1, wherein the resultant molded product additionally contains a binder or filler.

4,548,914

ZEOLITE CATALYSTS OF IMPROVED ACTIVITY AND PARA-SELECTIVITY

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 526,846, Aug. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 322,630, Nov. 19, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 709,821

Int. Cl.⁴ B01J *29/28*

U.S. Cl. 502—85 **12 Claims**

1. A method for treating a chemically modified zeolite catalyst in order to enhance the aromatics conversion activity and/or the para-selectivity of said catalyst, said catalyst comprising both a crystalline zeolite material having a constraint index within the approximate range of 1 to 2 and a silica/alumina mole ratio of at least 12 and a minor proportion

of one or more difficultly reducible oxides selected from the group consisting of oxides of the metals of Groups IA, IIA, IIIA, IVA, VA, VIA, VIIA, VIIIA, IB, IIIB, IVB and VB of the Periodic Chart and combination of phosphorus oxide with one or more of said metal oxides, said method comprising the steps of:

(i) contacting an inert inorganic gaseous diluent with liquid water, whereby said diluent becomes essentially saturated with water in the vapor state, and whereby water in the liquid state becomes dispersed in said diluent;

(ii) converting essentially all of said liquid water dispersed in said diluent to water in the vapor state by increasing the temperature of the water-containing diluent of step (i) to a temperature sufficient to accomplish such conversion; and

(iii) contacting said catalyst with said essentially liquid water-free diluent of step (i) at a temperature between about 40° C. and 700° C. for a period of from about 1 to 72 hours and at a rate of at least about 0.005 gram of water per gram of catalyst per hour.

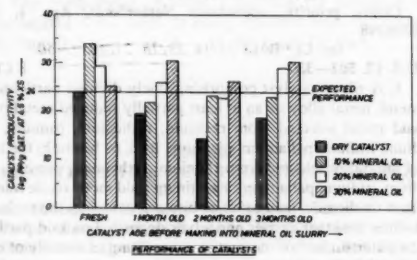
6. A method according to claim 1, wherein said difficultly reducible oxide is selected from magnesium oxide, calcium oxide, combinations of magnesium oxide and phosphorus oxide and combinations of calcium oxide and phosphorus oxide.

9. A method according to claim 1, wherein said zeolite is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 and ZSM-48.

4,548,915
OLEFIN POLYMERIZATION CATALYST COMPOSITION

Brian L. Goodall, and Robert C. Job, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 10, 1984, Ser. No. 598,616
Int. Cl.[4] C08F *4/02, 4/64, 110/06*
U.S. Cl. 502—104 **7 Claims**



1. A method for preparing high-activity, free-flowing solid catalyst components for alpha monoolefin polymerization comprising:

(a) halogenating a magnesium compound of the formula $MgR'R''$ wherein R' is an alkoxide or aryloxide group and R'' is an alkoxide or aryloxide group or halogen, with a halide of tetravalent titanium in the presence of a halohydrocarbon and an ester electron donor, and separating the solid reaction product from the reaction mixture;

(b) contacting the halogenated product with a tetravalent titanium halide and separating the resulting solid;

(c) contacting the resulting solid with an inert, light hydrocarbon liquid wherein said inert light hydrocarbon liquid is selected from the group consisting of iso-pentane, n-hexane, iso-octane and toluene to remove unreacted titanium compounds;

(d) adding a certain amount of a hydrocarbon mineral oil to a mixture of light hydrocarbon liquid and solid product, said mineral oil being a viscous, paraffinic/naphthenic hydrocarbon oil having a viscosity of about 50 to about 2000 SSU at 38° C. and wherein at least 80% by weight of said hydrocarbon mineral oil has an initial boiling point of 300° C. or higher, corrected to atmospheric pressure; and

(e) removing by evaporation the light hydrocarbon liquid from the resulting mixture, wherein the amount of hydrocarbon mineral oil added in step (d) is between about five percent by weight and 25 percent by weight, based on the combined weight of the solid component plus mineral oil, and is less than the amount whereby the resulting solid product is no longer free-flowing.

5. A free-flowing, high activity, stable catalyst composition for alpha monoolefin polymerization comprising a porous solid component and a hydrocarbon mineral oil wherein:

(a) said porous solid component comprises titanium tetrachloride, magnesium chloride and ester electron donor, having a pore volume of between about 0.1 and about 1.0 cc/gm;

(b) said hydrocarbon mineral oil is a viscous, paraffinic/naphthenic hydrocarbon oil having a viscosity of about 50 to about 2000 SSU at 38° C. and wherein at least 80% by weight of said hydrocarbon mineral oil has an initial boiling point of 300° C. or higher, corrected to atmospheric pressure; and

(c) said hydrocarbon mineral oil is mixed with said porous solid component such that the mineral oil fills the pores of said solid component and the resulting mineral oil-modified solid component remains relatively dry and free-flowing at ambient conditions and wherein the amount of hydrocarbon mineral oil is between about 5 percent by weight and about 25 percent by weight, based on the combined weight of said solid component and said hydrocarbon mineral oil.

6. The composition of claim 5 wherein said hydrocarbon mineral oil has an aromatic content by clay-gel analysis of less than about 30% by weight.

4,548,916
CATALYST PRODUCTION AND USE

Maurice G. Baker, Cleveland, England, assignor to Imperial Chemical Industries, PLC, London, England

Filed Jan. 24, 1984, Ser. No. 573,344
Claims priority, application United Kingdom, Feb. 2, 1983, 8302885
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—105 **13 Claims**

6. A process wherein (a) a solid composition containing a transition metal of Groups IVA, VA or VIA of the Periodic Table is mixed with (b) finely divided talc and/or a salt of aluminium or of a metal of Group IA or IIA of the Periodic Table and a carboxylic acid containing an aromatic group, and (a) and (b) are mixed in the relative proportions by weight of from 20:1 to 1:10.

9. The process of claim 6 wherein a solid compound of a transition metal is ground with a Lewis Base compound and before, after or during the grinding with the Lewis Base compound is also ground with component (b).

4,548,917
PROCESS FOR THE DISPROPORTIONATION OF SILANES

Jean-Luc Lepage, Sainte-Foy-les Lyon, and Gerard Soula, Meyzieu, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Feb. 24, 1984, Ser. No. 583,208
Claims priority, application France, Feb. 25, 1983, 83 03089
Int. Cl.[4] C07F *7/08*
U.S. Cl. 502—150 **21 Claims**

1. A process for the disproportionation of silanes having at least one Si—H bond which comprises reacting:

(a) a silane comprising at least one Si—H bond, of the general formula $R_nH_mSiX_{4-(n+m)}$ wherein R represents an alkyl or aryl group, X represents a halogen or an alkoxy

group, n is an integer equal to 0, 1, 2 or 3 and m is an integer equal to 1, 2 or 3, and

(b) a catalyst system comprising an ionic inorganic salt and a complexing agent which at least partially dissociates said salt and complexes the cation of said salt.

4,548,918

PROCESS FOR MANUFACTURING A HYDROCARBON CONVERSION CATALYST AND CATALYST PREPARED BY SAID PROCESS

Jean-Paul Bournonville, Chatou, and Chan T. Dinh, Le Vesinet, both of France, assignors to Societe Francaise des Produits pour Catalyse Pro-Catalyse, Rueil-Malmaison, France

Filed May 4, 1984, Ser. No. 607,110

Claims priority, application France, May 5, 1983, 83 07669

Int. Cl.[4] B01J *31/28*

U.S. Cl. 502—154 **13 Claims**

1. A process for manufacturing a hydrocarbon conversion catalyst which comprises the steps of:

(a) impregnating a carrier with an acid solution containing at least one halogen or halogen compound and at least one compound of a noble metal of the platinum family,

(b) drying the resultant impregnated carrier,

(c) calcining the resultant dried impregnated carrier,

(d) contacting the resultant calcined impregnated carrier with a solution of at least one organic compound selected from the group consisting of alkyl, cycloalkyl, aryl, alkylaryl and arylalkyl tin, germanium and lead compounds and halogenated derivatives thereof, in a hydrocarbon solvent selected from the group consisting of paraffinic, naphthenic and aromatic hydrocarbons containing 6 to 12 carbon atoms per molecule, said compound of a noble metal of the platinum family, said halogen or halogen compound, and said at least one organic compound being used in such proportions as to result in a catalyst containing 0.01 to 2% by weight of said noble metal of the platinum family, 0.005 to 0.1% by weight of said additional metal and 0.1 to 15% by weight of halogen and

(e) drying the thus prepared catalyst.

4,548,919

CATALYST COMPOSITIONS FOR POLYALIPHATIC ISOCYANATE-BASED POLYURETHANES

Ignazio S. Megna, Lebanon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 450,626, Dec. 17, 1982, abandoned. This application Jan. 4, 1984, Ser. No. 568,159

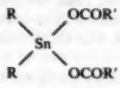
Int. Cl.[4] B01J *31/04*

U.S. Cl. 502—154 **3 Claims**

1. A catalyst composition for catalyzing reactions between poly aliphatic isocyanate compounds and organic compounds containing a plurality of hydroxyl groups, said catalyst composition consisting essentially of:

(a) from about 25 to about 75 parts by weight of lead naphthenate; and

(b) from about 75 to about 25 parts by weight of at least one dialkyltin dicarboxylate compound of the formula:



wherein R is selected from C_1 to C_8 alkyl and R' is selected from C_1 to C_{18} alkyl, based upon 100 parts by weight of said catalyst composition.

4,548,920

HYDRODENITRIFICATION CATALYST

Mark S. Thompson, and Charles T. Adams, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1984, Ser. No. 593,060

Int. Cl.[4] B01J *27/02, 29/06, 31/02, 27/20*

U.S. Cl. 502—219 **28 Claims**

1. A method for preparing a supported hydroconversion catalyst having improved hydrodenitrification activity, which comprises: mixing an amount of molybdenum and/or tungsten carbonyl compound(s) sufficient to provide from about 10 to 20%wt. metal on a suitable support with at least a catalytic amount of an organic liquid selected from the group consisting of dienes, trienes or monoaromatics, in the presence of tetrahydrofuran; adding sufficient elemental sulfur to said liquid mixture to convert said carbonyl compound(s) to the corresponding disulfide; mixing a desired quantity of dried solid catalyst support with said liquid mixture; heating said liquid-solid mixture until metal carbonyl conversion to disulfide is substantially complete; separating support catalyst from any excess liquid mixture; drying said catalyst and calcining said catalyst under inert gas at elevated temperatures.

4,548,921

SILVER CATALYST AND A METHOD FOR THE PREPARATION THEREOF

John W. Geus, Bilthoven, and Krijn P. de Jong, Utrecht, both of Netherlands, assignors to Nederlandse Organisatie Voor Zuiver-Wetenschappelijk Ondebzoek (zwo), The Hague, Netherlands

Filed Mar. 18, 1983, Ser. No. 476,660

Claims priority, application Netherlands, Apr. 1, 1982, 8301398

Int. Cl.[4] B01J *23/14, 23/18, 23/40, 23/50*

U.S. Cl. 502—330 **8 Claims**

1. A silver catalyst comprising finely divided particles of a metal, metal alloy or an at least partially reduced metal oxide, said metal selected from rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, lead, or bismuth; the metal of said alloy selected from rhenium, ruthenium, osmium, rhodium, iridium, palladium or platinum; said metal oxide selected from tin dioxide, lead oxide or bismuth oxide; on the surface of a sinter resistant carrier and silver deposited on said particles, the outer surface of the particles consisting essentially of monometallic silver.

4,548,922

DRUG ADMINISTRATION

Martin C. Carey, Wellesley; Alan C. Moses, Waban, and Jeffrey S. Flier, Newton, all of Mass., assignors to Beth Israel Hospital and The Brigham & Women's Hospital, Inc., both of Boston, Mass.

Filed Jun. 6, 1983, Ser. No. 501,187

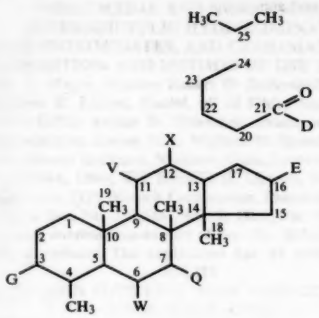
Int. Cl.[4] A61K *37/26, 31/56*

U.S. Cl. 514—4 **33 Claims**

1. A composition useful for the treatment of diabetes comprising, in admixture:

(a) as an active ingredient, a medically-effective amount of insulin; and

(b) as an adjuvant, a biocompatible, water-soluble, amphiphilic steroid of the following formula:



wherein a dashed line represents a single or a double bond;

D represents a group having a molecular weight below 600 daltons which renders an effective amount of said steroid water-soluble at pH 7.4;

E represents OAc, a lower alkyl group or a lower heteroalkyl group;

G represents OAc, OH, a lower alkyl group or a lower heteroalkyl group;

W represents OAc or H;

Q represents OH or H, provided that, when W is OAc and Q is OH, Q is β-equatorial;

V represents H or α-axial OH; and

X represents H or α-axial OH, said steroid (i) containing two OH groups; and (ii) being capable of increasing the permeability to insulin of a body surface across which insulin is to be administered, in an amount effective to increase the permeability of said body surface to insulin.

2. The composition of claim 1 wherein the steroid is in unconjugated form, with D being selected from the group consisting of O^-Na^+, O^-K^+, O^-Rb^+ and O^-Cs^+.

4,548,923

MURAMYL PEPTIDES AND PROCESSES FOR THEIR MANUFACTURE

Albert Hartmann, Grenzach, Fed. Rep. of Germany; Oskar Wacker, Basel; Gerhard Baschang, Bettingen, both of Switzerland, and Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

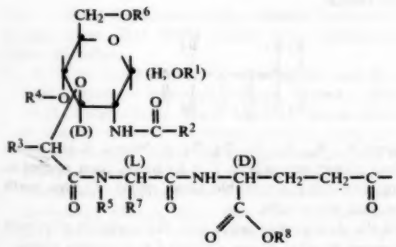
Continuation of Ser. No. 515,836, Jun. 21, 1983, abandoned. This application May 9, 1984, Ser. No. 608,911

Claims priority, application Switzerland, Jun. 23, 1982, 4527/82

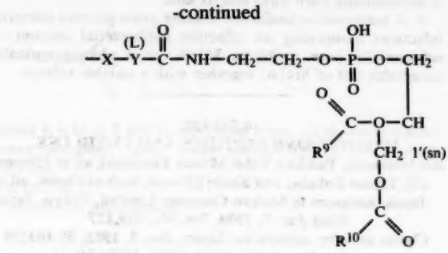
Int. Cl.[4] **A61K** *37/00;* **C07D** *333/32*

U.S. Cl. 514—8 **17 Claims**

1. The compounds of the formula I



(I)



wherein

R^1, R^4 and R^6 are hydrogen, R^2 is methyl or ethyl, R^3 is hydrogen or methyl, R^5 is hydrogen, R^7 is methyl, R^8 is hydrogen or C_1–C_4-alkyl, X is the group NH, Y is ethylidene, and R^9 and R^{10} are N-pentadecyl, and their pharmaceutically acceptable salts.

4,548,924

ANTIBIOTICS M43B AND M43C, PHARMACEUTICAL COMPOSITION AND METHOD OF USE

Karl H. Michel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 16, 1984, Ser. No. 600,726

Int. Cl.[4] **A61K** *37/02, 31/71;* **C07H** *15/20*

U.S. Cl. 514—10 **12 Claims**

9. A composition useful for treating gram-positive bacterial infections comprising an effective antibacterial amount of antibiotic M43C or a pharmaceutically acceptable salt of M43C together with a suitable vehicle.

10. A method for treating infections caused by gram-positive bacteria which comprises administering an effective amount of a composition of claim 9 to an animal.

4,548,925

ANTIBIOTIC M43A, PHARMACEUTICAL COMPOSITION AND METHOD OF USE

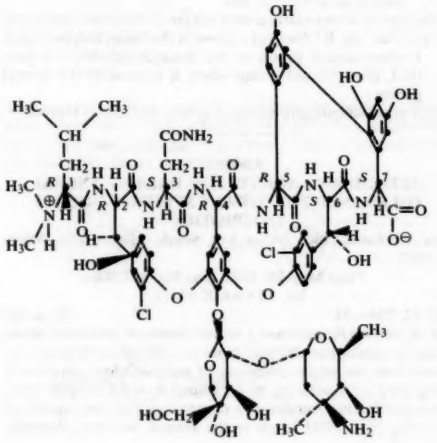
Harvey M. Higgins, Jr., Danville; Kurt E. Merkel, Mooresville, both of Ind., and Mack H. McCormick, Florence, Oreg., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 16, 1984, Ser. No. 600,729

Int. Cl.[4] **A61K** *37/02, 31/71;* **C07H** *15/20*

U.S. Cl. 514—10 **6 Claims**

1. Antibiotic M43A which has the formula



in substantially pure form and its salts.

5. A composition useful for treating gram-positive bacterial infections comprising an effective antibacterial amount of substantially pure antibiotic M43A, or a pharmaceutically acceptable salt of M43A, together with a suitable vehicle.

4,548,926

HYPOTENSIVE PEPTIDES AND THEIR USE

Rei Matsueda; Yuichiro Yabe; Mitsuo Yamazaki, all of Hiromachi; Tatsuo Kokubu, and Kunio Hiwada, both of Onsen, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

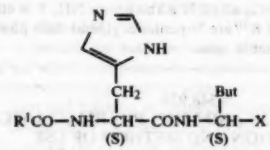
Filed Jun. 7, 1984, Ser. No. 618,127

Claims priority, application Japan, Jun. 9, 1983, 58-103230

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—19 **18 Claims**

1. Compounds of formula (I):



(I)

wherein:

R^1 represents a C_1–C_4 alkyl group having:

(a) an amino or protected amino substituent on its α-carbon atom and

(b) a phenyl or naphthyl group, a 5- or 6-membered heterocyclic group having one or more of hetero atoms selected from nitrogen, oxygen and sulfur atoms, a 3-indolinyl group or a 1,2,3,4-tetrahydro-β-carbolin-3-yl group, said R^1CO— having one or more substituents selected from an amino group and a protected amino group; or

R^1 represents a 1,2,3,4-tetrahydro-β-carbolin-3-yl group or a 1,2,3,4-tetrahydro-β-carbolin-1-yl group;

But represents a butyl group selected from the isobutyl and sec-butyl groups;

X represents

the formyl group or,

a group of formula —$CH(R^2)$—Y wherein R^2 is a hydrogen atom, an alkyl group of 1 to 8 carbon atoms or a substituted alkyl group of 1 to 8 carbon atoms and having at least one substituent selected from a hydroxy, mercapto, amino, carbamoyl, formyl, phenyl, naphthyl or 5- or 6-membered heterocyclic group having one or more of hetero atoms of N, O and S, and Y is hydroxy, mercapto or formyl; and

the carbon atoms marked with (S) are of the S-configuration;

provided that R^1 does not represent the benzyloxycarbonyl-L-phenylalanyl group or the benzyloxycarbonyl-L-prolyl-L-phenylalanyl group when X represents the formyl group;

and pharmaceutically acceptable salts and esters thereof.

4,548,927

METHOD AND AGENTS FOR RAISING ANIMAL TOLERANCE TO OXIDANT STRESS-INDUCING ANTIBIOTICS

John W. Eaton, 1804 Irving Ave. South, Minneapolis, Minn. 55403

Filed May 25, 1983, Ser. No. 497,786

Int. Cl.[4] A61K *31/71*

U.S. Cl. 514—34 **29 Claims**

1. A method for increasing animal tolerance to oxidant stress inducing antibiotics derived from a class of compounds selected from the group consisting of anthracycline compounds comprising administering to an animal in need of such treatment an effective amount of a nontoxic redox dye capable of depleting NAD(P)H levels in the animal, within a clinically effective period proximate to the time of administration of said antibiotic to said animal.

4,548,928

ANTIHYPERTENSIVE AMIDES

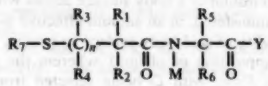
John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; Bruce E. Williams, Cottage Crove, Minn., and Alfred Schwab, Williston Park, N.Y., assignors to USV Pharmaceutical Co., Tarrytown, N.Y.

Division of Ser. No. 323,852, Nov. 23, 1981, Pat. No. 4,507,312, which is a division of Ser. No. 200,180, Oct. 24, 1980, Pat. No. 4,304,771, which is a continuation-in-part of Ser. No. 57,175, Jul. 13, 1979, Pat. No. 4,256,761. This application Nov. 19, 1984, Ser. No. 672,651

Int. Cl.[4] A61K *27/00;* **C07D** *265/32, 265/30*

U.S. Cl. 514—232 **10 Claims**

1. Compounds of the structure:



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are independently hydrogen, alkyl, alkenyl containing 2 to 6 carbon atoms, alkynyl containing 2 to 6 carbon atoms, phenyl-alkyl, or cycloalkyl containing 3 to 16 carbon atoms,

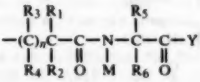
n is an integer from 0 to 4 inclusive,

M is heterocyclic and is selected from the group consisting of morpholinyl, pyrrolyl and

Y is hydroxy, alkoxy, amino, aminoalkylanoyl, hydrocarbyloaryloxy containing from 6 to 10 carbon atoms, aminoalkoxy, or hydroxyalkoxy, and

R_7 is hydrogen, alkanoyl, carboxyalkyanoyl, hydroxyalkanoyl, amino-alkanoyl, cyano, amidino, carbalkoxy,

wherein Z is hydrogen, alkyl, hydroxyalkyl, aminoalkyl or the radical



wherein R_1, R_2, R_3, R_4, R_5, R_6, n, M and Y are as described above; and where Y is hydroxy, their nontoxic, pharmaceutically acceptable alkali metal, alkaline earth metal, and amine salts,

wherein the alkyl groups per se and alkyl moieties of groups containing an alkyl group, contain 1 to 6 carbon atoms.

4,548,929

INSECTICIDAL AND NEMATOCIDAL HETEROBICYCLIC HYDROXIMINATES, THIOHYDROXIMIDATES, AND CARBAMATE ESTERS, COMPOSITION, AND METHOD OF USE THEREOF

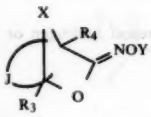
Thomas A. Magee, Mentor; Robert D. Battershell, Painesville; Lawrence E. Limpel, Euclid, all of Ohio; Andrew W. Ho, Pinole, Calif.; Arthur W. Friedman, Beachwood, Ohio; H. Glenn Corkins, Ewing, N.J.; William W. Brand, Painesville, Ohio; Russell Buchman, Madison, Ohio; Louis Storace, Mentor-on-Lake, Ohio, and Edmond R. Osgood, Mentor, Ohio, assignors to SDS Biotech Corporation, Painesville, Ohio

Division of Ser. No. 317,516, Nov. 2, 1981, Pat. No. 4,424,213, which is a continuation-in-part of Ser. No. 205,436, Nov. 10, 1980, abandoned. This application Apr. 18, 1983, Ser. No. 486,211

Int. Cl.[4] A01N *43/10, 43/12, 43/18, 43/40;* C07D *311/02, 313/08, 407/12, 417/12*

U.S. Cl. 514—85 4 Claims

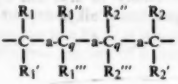
3. An insecticidal and nematocidal composition consisting essentially of a carrier and an insecticidally and nematocidally effective amount of a heterobicyclic compound of the formula:



(III)

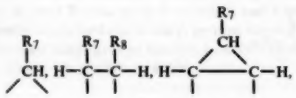
wherein

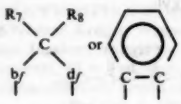
J represents the group



where q, independently, is 0 or 1, a , independently, is a single or double bond and R_1, R_1', R_1'', R_1''', R_2, R_2', $R_2''$and R_2''' are defined below;

X represents a bridge member selected from





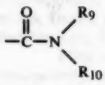
where R_7 and R_8 independently represent hydrogen, halogen, cyano, lower alkyl, lower alkoxy, lower alkoxycarbonyl or lower alkylthio;

R_1–R_1''', inclusive, R_2–R_2''', inclusive, R_3 and R_4 independently represent hydrogen, halogen, hydroxy, cyano, lower alkyl, lower alkoxy, lower haloalky, lower alkylcarboxy, arylcarboxy, lower alkylaminocarboxy, carbamoyl, lower alkylcarbamoyl, lower dialkylcarbamoyl, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, lower alkyl(NH_2), lower dialkyl(NH_2), lower alkoxycarbonyl, trifluoromethyl, pyrrolidyl, phenyl, nitro, thiocyano, thiocarbamyl, lower alkylthiocarbamyl, lower dialkylthiocarbamyl, arylthiocarbamyl or the group

where E is O or S and G represents lower alkyl, lower alkoxy, lower alkylthio, NH_2, lower alkyl(NH_2) or lower dialkyl(NH_2);

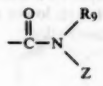
g is 0, 1 or 2;

Y represents hydrogen or



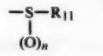
(I)

wherein R_9–R_{10} independently represent hydrogen, lower alkyl, hydroxy lower alkyl, lower alkenyl, lower alkynyl, lower aralkyl, lower alkoxyalkyl or lower polyoxyalkylene; or



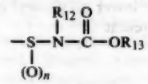
(2)

where R_9 is the same as defined before and Z represents



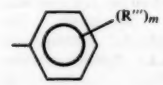
(a)

where n is 0, 1 or 2 and R_{11} is pyridyl, pyrimidyl, phenyl or phenyl substituted with at least one member selected from hydroxy, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl or cyano;

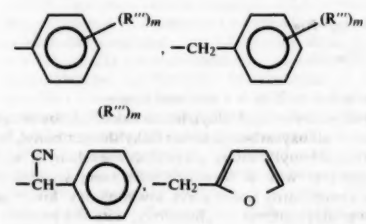


(b)

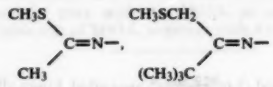
where n is 0, 1 or 2, and R_{12} is lower alkyl, lower alkoxyalkyl or



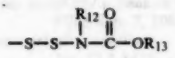
where m is 0, 1, 2 or 3 and R''' is hydrogen, halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl or phenyloxy and R_{13} is lower alkyl, lower, alkoxyalkyl, naphthyl, lower alkylthioalkyl



where $(R''')_m$ is as defined before,

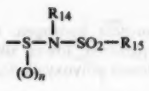


or Q where Q-OY represents formula (III) as defined herein;



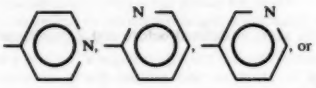
(c)

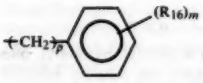
where R_{12}–R_{13} are as defined before;



(d)

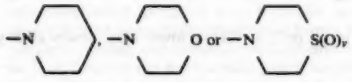
where n is 0, 1 or 2, R_{14} is phenyl, lower alkyl, lower alkoxyalkyl, lower alkanoyl, lower alkoxycarbonylalkyl, lower alkylthioalkyl, lower carboxyalkyl and R_{15} is lower alkyl,



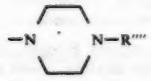


where m is 0–5, p is 0–5 and R_{16} is halogen, lower alkyl, trifluoromethyl, nitro or lower alkoxy;

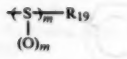
(e) —S-$NR_{17}R_{18}$ where R_{17}–R_{18} are lower alkyl, aryl or together with the nitrogen atom represent



where v is 0, 1 or 2 or

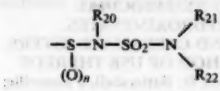


where R'''' is lower alkyl;



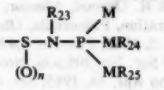
(f)

where n is 0, 1 or 2, m is 1 or 2 and R_{19} is lower alkyl, lower cycloalkyl, lower haloalkyl, lower cyanoalkyl, lower alkoxycarbonyl, lower (alkylthio)carbonyl, lower alkoxy(thiocarbonyl), lower alkylthio(thiocarbonyl), aryl or substituted aryl with at least one substituent selected from halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl or phenyloxy, with the proviso that when R_{19} is aryl or substituted aryl, m is 2;



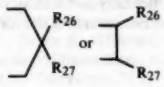
(g)

where n is 0, 1 or 2, R_{20} is lower alkyl and R_{21}–R_{22} are the same as R_{17}–R_{18} as defined before;

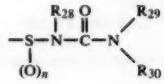


(h)

where n is 0, 1 or 2, M, independently, is S or O and R_{23}–R_{25} independently represent lower alkyl or R_{24} and R_{25} together represent

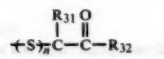


where R_{26}–R_{27} independently represent hydrogen or lower alkyl;



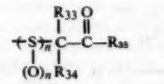
(i)

where n is 0, 1 or 2, R_{28} is lower alkyl or aryl and R_{29}–R_{30} independently represent hydrogen, lower alkyl, aryl or lower alkoxy;



(j)

where n is 1 or 2, R_{31} is lower alkyl and R_{32} is fluoro, lower alkyl, aryl or lower aralkyl;

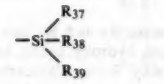


(k)

where m is 0, 1 or 2, n is 1 or 2 and R_{33}–R_{35} independently represent hydrogen or lower alkyl;

(l)

where T is O, S or —CH_2—, m is 1 or 2, n is 0 or 1 and R_{36}=R_{13} as defined before;



(m)

where R_{37}–R_{39} are lower alkyl or aryl;

(n)

where L represents lower alkyl, cyano, lower alkoxy, aryloxy, lower alkylthio, arylthio or —ON=$CR_{40}R_{41}$ where R_{40}–R_{41} are the same as R_{12}–R_{13} as defined before; or

(o)

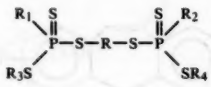
where V represents halogen, lower alkoxy or lower alkylthio; and further provided the term "aryl" or terms incorporating the root word "aryl" as used throughout this claim means phenyl or naphthyl.

4,548,930
BIS-ALKYLENE TRITHIOPHOSPHONATE INSECTICIDES

Alexandra B. Shortt, and William G. Haag, both of Pleasant Hill, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

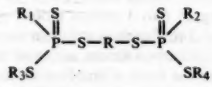
Filed Dec. 27, 1983, Ser. No. 565,664
Int. Cl.[4] A01N *57/12;* **C07F** *9/40*
U.S. Cl. 514—103 **29 Claims**

1. A compound having the formula



in which R is an alkylene group having from 1 to 5 carbon atoms; R_1 and R_2 are methyl or ethyl; and R_3 and R_4 are independently branched chain alkyl groups having 4 carbon atoms, or branched alkyl groups having 5 carbon atoms and a branching at the α- or β-carbon atom.

22. A method for controlling insects comprising applying to the insect or to a locus at which control is desired an insecticidally effective amount of a compound having the formula



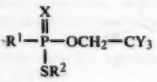
in which R is an alkylene group having from 1 to 5 carbon atoms; R_1 and R_2 are methyl or ethyl; and R_3 and R_4 are independently branched chain alkyl groups having 4 carbon atoms, or branched alkyl groups having 5 carbon atoms and a branching at the α- or β-carbon atom.

4,548,931
THIOPHOSPHONIC ACID ESTER PESTICIDES

Bernd-Wieland Krüger, Wuppertal; Bernhard Homeyer, Leverkusen; Ingeborg Hammann, Muelheim, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 4, 1983, Ser. No. 538,856
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238363
Int. Cl.[4] A01N *57/04;* **C07F** *9/40*
U.S. Cl. 514—141 **10 Claims**

1. An O-(2,2,2-trihlogenoethyl) S-alkyl (di)thiophosphonate of the formula



in which
X is oxygen or sulphur,
Y is halogen,
R^1 is methyl, ethyl or phenyl, and
R^2 is n-propyl or sec-butyl.

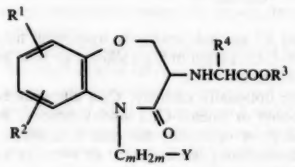
9. A method of combating insects, acarids and nematodes which comprises administering to such insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1.

4,548,932
3-AMINO-4-OXO-2,3,4,5-TETRAHYDRO-1,5-BENZOXAZEPINE DERIVATIVES

Hirosada Sugihara, Osaka; Kohei Nishikawa, Kyoto, and Katsumi Ito, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Doshomachi, Japan

Filed Aug. 3, 1984, Ser. No. 637,620
Claims priority, application PCT Int'l Appl., Aug. 12, 1983, PCT/JP83/00264; Apr. 27, 1984, PCT/JP84/00221; Jul. 13, 1984, PCT/JP84/00362
Int. Cl.[4] A61K *31/55;* **C07D** *513/04*
U.S. Cl. 514—211 **19 Claims**

1. A compound of the formula



wherein R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly form tri- or tetramethylene,

R^3 is hydrogen; optionally carboxy, C_{1-4} alkoxycarbonyl, phenoxycarbonyl or phenyl-C_{1-4} alkoxycarbonyl substituted C_{1-6} alkyl; or optionally halogen, C_{1-4} alkyl, C_{1-4} alkoxy, methylenedioxy, amino, nitro or hydroxy substituted phenyl-C_{1-4} alkyl,

R^4 is C_{1-16} alkyl substituted by oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazepinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiadinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydroxazepinyl, perhydrothiazepinyl, perhydroxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydro-diazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochromanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisobenzofuryl, 2,3-dihydrobenzo[b]thienyl, 1,3-dihydrobenzo[c]thienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2-benzoxepinyl, 1,2,4,5-tetrahydro-3-benzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiepinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl, 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4-benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiazinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzodioxepanyl, 2,3-dihydro-5H-1,4-benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro-5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydro-isoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, phenyl, naph-

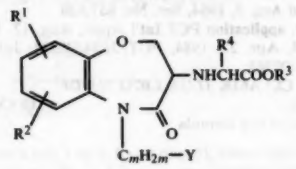
thyl, phenyl-C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,

Y is carboxyl, C_{1-4} alkoxycarbonyl, phenyl-C_{1-4} alkoxycarbonyl or carboxyl amidated by an α-amino acid whose carboxyl group may be substituted by C_{1-4} alkyl or phenyl-C_{1-4} alkyl, the α-amino acid being glycine, valine, leucine, isoleucine, threonine, N^{α}-lysine, methionine, phenylalanine or tryptophan, and

the group C_mH_{2m} represents methylene, ethylene or ethylidene,

or a pharmaceutically acceptable salt thereof.

19. Method for treatment of hypertension which comprises administration of an effective antihypertensive amount of a compound



wherein R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly form tri- or tetramethylene,

R^3 is hydrogen; optionally carboxy, C_{1-4} alkoxycarbonyl, phenoxycarbonyl or phenyl-C_{1-4} alkoxycarbonyl substituted C_{1-6} alkyl; or optionally halogen, C_{1-4} alkyl, C_{1-4} alkoxy, methylenedioxy, amino, nitro or hydroxy substituted phenyl-C_{1-4} alkyl,

R^4 is C_{1-16} alkyl substituted by oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazepinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiadinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydroxazepinyl, perhydrothiazepinyl, perhydroxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydro-diazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochromanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisobenzofuryl, 2,3-dihydrobenzo[b]thienyl, 1,3-dihydrobenzo[c]thienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2-benzoxepinyl, 1,2,4,5-tetrahydro-3-benzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiepinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl, 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4-benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiazinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzodioxepanyl, 2,3-dihydro-5H-1,4-benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro-5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydro-isoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, phenyl, naphthyl, phenyl-C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,

Y is carboxyl, C_{1-4} alkoxycarbonyl, phenyl-C_{1-4} alkoxycarbonyl or carboxyl amidated by an α-amino acid whose carboxyl group may be substituted by C_{1-4} alkyl or phenyl-C_{1-4} alkyl, the α-amino acid being glycine, valine, leucine, isoleucine, threonine, N^{α}-lysine, methionine, phenylalanine or tryptophan, and

the group C_mH_{2m} represents methylene, ethylene or ethylidene,

or a pharmaceutically acceptable salt thereof.

4,548,933

SEDATIVE COMPOSITIONS CONTAINING 10-PIPERAZINO-5-CYANOMETHYLENE-DIBENZO[A,D]-CYCLOHEPTENES

Gerd Steiner, Kirchheim; Hans P. Hofmann, Ludwigshafen; Horst Kreiskott, Wachenheim; Hans-Juergen Teschendorf, and Dieter Lenke, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

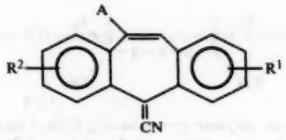
Division of Ser. No. 237,962, Feb. 25, 1981, Pat. No. 4,447,610. This application Dec. 13, 1983, Ser. No. 560,964

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009034

Int. Cl.⁴ A61K *31/45, 31/95, 31/495*

U.S. Cl. 514—255 **4 Claims**

1. A sedative comprising a pharmacologically acceptable carrier and an effective amount of a compound of the formula I



(I)

where R^1 and R^2 are hydrogen, halogen, alkyl of 1 to 3 carbon atoms or trifluoromethyl, and A is an amino radical $—NR^4R^5$, where R^4 and R^5 together with the nitrogen atom by which they are linked form a piperidine, piperazine or homopiperazine ring, the second nitrogen atom where present being unsubstituted or substituted by alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, alkoxyalkyl, the alkoxy and alkyl radical each being of 1 to 3 carbon atoms, cycloalkyl or cycloalkylmethyl, of 3 to 7 carbon atoms in the cycloalkyl ring, or alkynol of 2 to 5 carbon atoms, and may be further substituted by oxygen in the form of an N-oxide, its pure cis-isomer and trans-isomer, and its physiologically tolerated addition salts with acids.

4,548,934

4H-1,4-BENZOTHIAZINE DERIVATIVES

Gerd Fengler, Krefeld; Dieter Arlt, Cologne; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

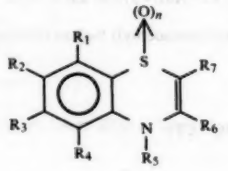
Filed Aug. 1, 1983, Ser. No. 518,901

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229124; Aug. 4, 1982, 3229125; Aug. 4, 1982, 3229126

Int. Cl.⁴ C07D *279/16;* **A61K** *31/54*

U.S. Cl. 514—225 **10 Claims**

1. A 4H-1,4-benzothiazine compound of the formula (I)



(I)

in which

n represents 0, 1, or 2,

R_1 and R_4 are identical or different and each represent hydrogen or halogen,

R_2 and R_3 are identical or different and each represent hydrogen, halogen or nitro,

R_5 and R_6 are identical or different and each is hydrogen or C_1–C_4-alkyl,

R_7 represents C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl or carboxyl

with the proviso that R_1, R_2, R_3 and R_4 do not denote hydrogen simultaneously.

4,548,935
DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTI-HYPERTENSIVE AGENTS, COMPOSITIONS AND USE

David Alker, Eastry, Nr. Deal; Peter E. Cross, Canterbury, and Simon F. Campbell, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

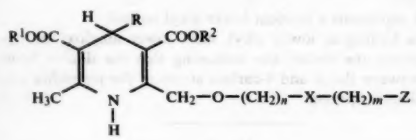
Filed Jan. 16, 1985, Ser. No. 691,971

Claims priority, application United Kingdom, Jan. 18, 1984, 8401288

Int. Cl.[4] **A61K** *31/44, 31/535;* **C07D** *413/14, 417/12*

U.S. Cl. 514—230 **12 Claims**

1. A compound having the formula:



(I)

or a pharmaceutically acceptable salt thereof;

wherein

R is aryl or heteroaryl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

n is 1 or 2;

m is 1, 2 or 3;

X is a 5 or 6 membered aromatic heterocyclic group which is linked to the adjacent alkoxymethyl group by a ring carbon atom thereof; and

Z is a group $—NR^3R^4$ or a 5 or 6 membered nitrogen containing heterocyclic group;

wherein

R^3 is H or C_1–C_4 alkyl;

R^4 is H, C_1–C_4 alkyl, $CO(C_1$–C_4 alkyl), $COCF_3$, $CONR^5R^6$, $SO_2(C_1$–C_4 alkyl) or a heterocyclic or SO_2-heterocyclic group, wherein the heterocyclic group is optionally substituted; and

R^5 and R^6 are each independently H or C_1–C_4 alkyl or taken together with the nitrogen atom to which they are attached, they form a pyrrolidinyl, piperidyl, morpholino, piperazinyl or N-(C_1–C_4 alkyl)piperazinyl group.

11. A method of treating or preventing hypertension in man which comprises administering an antihypertensive effect amount of a compound according to claim 1.

4,548,936
Δ^1-PYRROLINE THIOLACTIM ETHERS AND A PROCESS FOR THEIR PREPARATION

Gerhard Beck, Frankfurt am Main; Wilhelm Bartmann, Bad Soden am Taunus; Jochen Knolle, Kriftel, and Richard H. Rupp, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

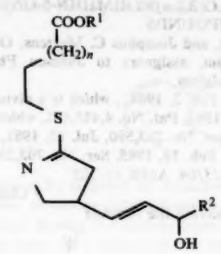
Filed May 5, 1982, Ser. No. 375,106

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3117979

Int. Cl.[4] **C07D** *207/24, 405/06, 409/06;* **A61K** *31/40*

U.S. Cl. 514—422 **4 Claims**

1. A compound of the formula



wherein

n is an integer from 0 to 4 inclusive,

R^1 is hydrogen, linear or branched alkyl having up to 8 carbon atoms, linear or branched unsaturated aliphatic hydrocarbon having 3 to 6 carbon atoms, cycloaliphatic hydrocarbon having 3 to 7 carbon atoms, araliphatic hydrocarbon having 7 to 9 carbon atoms, a physiologically acceptable metal ion, NH_4^+, methylammonium, dicyclohexylammonium, or tris-(hydroxymethyl)-methyl ammonium,

R^2 is phenyl or phenyl mono-substituted by halogen, trifluoromethyl and/or alkyl or alkoxy each having 1–6 carbon atoms, or is cycloaliphatic having 3–8 carbon atoms, linear or branched alkyl having up to 8 carbon atoms, linear or branched unsaturated aliphatic hydrocarbon having 3 to 8 carbon atoms, or is such aliphatic hydrocarbon substituted (a) by linear or branched alkoxy having up to 6 carbon atoms, by linear or branched alkenyloxy or alkynyloxy having 3 to 6 carbon atoms, or is such aliphatic hydrocarbon substituted (b) by halogen, cycloalkyl having 3–7 carbon atoms, phenyl, alpha- or beta-thienyl, alpha- or beta-furyl, or such thienyl or furyl mono-, di-, or tri-substituted by halogen, trifluoromethyl, and/or alkyl or alkoxy each having 1–6 carbon atoms, or is such aliphatic hydrocarbon substituted (c) by phenoxy, alpha- or beta-thienyloxy, or cycloalkoxy having 3–7 carbon atoms, or by such phenoxy, thienyloxy, or cycloalkoxy which is mono-, di-, or tri-substituted by halogen, trifluoromethyl, and/or alkoxy having 1–6 carbon atoms.

4,548,937
METHOD FOR PREVENTING BODY FAT DEPOSITION IN MAMMALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to Montefiore Hospital, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,181, Feb. 9, 1982, Pat. No. 4,415,576, which is a continuation-in-part of Ser. No. 249,812, Apr. 1, 1981, Pat. No. 4,351,835. This application Sep. 6, 1983, Ser. No. 529,403

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.[4] **A61K** *31/19*

U.S. Cl. 514—251 **7 Claims**

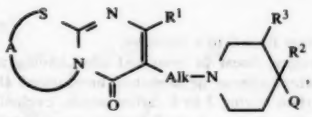
1. A method for controlling the weight in a mammal, which comprises administering orally to an intact mammal in need thereof a therapeutically effective amount of pyruvate to induce a weight loss or to reduce an expected weight gain from a given diet.

4,548,938
5-H-1,3,4-THIADIAZOLO[3,2-a]PYRIMIDIN-5-ONE COMPOUNDS

Ludo E. J. Kennis, Turnhout, and Josephus C. Mertens, Oud-Turnhout, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 576,291, Feb. 2, 1984, , which is a division of Ser. No. 370,653, Apr. 21, 1982, Pat. No. 4,443,451, which is a continuation-in-part of Ser. No. 283,590, Jul. 15, 1981, abandoned. This application Feb. 19, 1985, Ser. No. 703,233
Int. Cl.[4] C07D *513/04;* A61K *31/505*
U.S. Cl. 514—258 9 Claims

1. A chemical compound having the formula



(I)

the pharmaceutically acceptable acid-addition salts and the stereochemically isomeric forms thereof, wherein:

R^1 is hydrogen, lower alkyl or Ar;

R^2 is hydrogen, lower alkyl or Ar;

R^3 is hydrogen or lower alkyl;

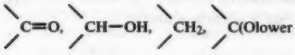
Alk is a lower alkanediyl radical;

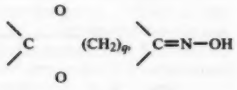
A is a bivalent radical having the formula

having the carbon atom attached to the S-atom, wherein R^6 is selected from the group consisting of hydrogen and lower alkyl and

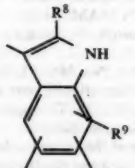
Q is a member selected from the group consisting of a radical having the formula —X—Ar (a)

wherein X is a member selected from the group consisting of





a radical having the formula



(b)

wherein R^8 is hydrogen or lower alkyl and R^9, R^{10} and R^{11} are each independently selected from the group consisting of hydrogen and halo;

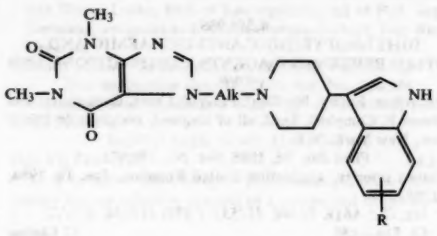
wherein Ar is phenyl or substituted phenyl, said substituted phenyl bearing an amino group and/or 1,2 or 3 halo atoms.

4,548,939
1H-INDOL-3-YL CONTAINING 1,3-DIMETHYL-1H-PURINE-2,6-DIONES

Ludo E. J. Kennis, Turnhout; Jan Vandenberk, Beerse, and Jozef M. Boey, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N. V., Beerse, Belgium

Filed Oct. 1, 1984, Ser. No. 656,561
Int. Cl.[4] C07D *473/08;* A61K *31/505*
U.S. Cl. 514—265 6 Claims

1. A chemical compound having the formula



(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein

Alk represents a bivalent lower alkyl radical;

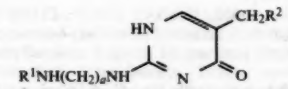
R is hydrogen, lower alkyl, halo, lower alkyloxy or hydroxy; the dotted line indicating that the double bond between the 3- and 4-carbon atoms of the piperidine nucleus is optional.

4,548,940
PYRIDYLAMINOALKYLAMINOPYRIMIDONES USEFUL AS HISTAMINE H_1-ANTAGONISTS

Robert J. Ife, Stevenage, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Dec. 20, 1983, Ser. No. 563,497
Claims priority, application United Kingdom, Dec. 23, 1982, 8236636
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.[4] A61K *31/505;* C07D *239/02*
U.S. Cl. 514—272 11 Claims

1. A compound of formula (1):



(I)

or a pharmaceutically acceptable acid addition salt thereof where

R^1 is 2- or 3-pyridyl optionally bearing one or two substituents which are the same or different and which are C_{1-4} alkyl, C_{1-4} alkoxy, halogen, nitro, cyano or trifluoromethyl;

a is 2 to 4; and

R^2 is phenyl optionally bearing one or two substituents which are the same or different and are halogen, hydroxy, C_{1-4} alkyl or C_{1-4} alkoxy or a methylenedioxy group or is 3-pyridyl; N-oxo-3-pyridyl; 6-methyl-3-pyridyl; N-oxo-6-methyl-3-pyridyl; 6-hydroxymethyl-3-pyridyl; 4,6-dimethyl-3-pyridyl; N-oxo-4,6-dimethyl-3-pyridyl; 6-hydroxymethyl-4-methyl-3-pyridyl; 5,6-dimethyl-3-pyridyl; N-oxo-5,6-dimethyl-3-pyridyl; 6-hydroxy-methyl-5-methyl-3-pyridyl; 4-pyridyl or N-oxo-4-pyridyl.

11. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,548,941

1,5-METHANO-1H-4-BENZAZONINE DICARBOXYLATES, PROCESS FOR PREPARING AND USE AS CALCIUM BLOCKERS

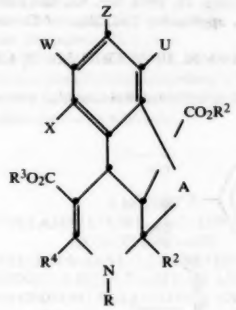
Wasyl Halczenko, Hatfield, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 30, 1984, Ser. No. 635,953

Int. Cl.[4] C07D *221/22*

U.S. Cl. 514—295 **7 Claims**

1. A compound represented by the general structural Formula (I):



(I)

wherein:

A is

wherein R^7 and R^8 independently are hydrogen or C_1–C_8 alkyl;

R is hydrogen or C_1–C_8 alkyl;

R^1 and R^4 independently are hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl;

R^2 and R^3 independently are C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 dihydroxyalkyl, C_2–C_8 alkoxyalkyl, C_3–C_8 alkoxy(alkoxyalkyl), C_1–C_8 aminoalkyl wherein the amino group is NR^5R^6 in which R^5 and R^6 independently are hydrogen, C_1–C_8 alkyl, C_7–C_{14} phenylalkyl; and

X, W, Z and U are independently hydrogen, C_1–C_8 alkyl, C_1–C_8 alkoxy, C_7–C_{14} alkoxyphenyl or phenoxy;

or a pharmaceutic ally acceptable salt thereof.

5. A pharmaceutical composition useful in the treatment of cardiovascular disorders in which a high cellular concentration of Ca^{++} is a factor, which comprises a nontoxic therapeutically effective amount of a compound according to claim 1 in an admixture with a pharmaceutically acceptable carrier.

4,548,942

ANTI-ACNE USE OF DERIVATIVES OF (5,4B)-ISOTHIAZOLO PYRIDINE-3-ONE

Braham Shroot, Antibes, and Jean Maignan, Tremblay les Gonesse, both of France, assignors to Societe Anonyme dite: L'Oreal and Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D., both of Paris, France

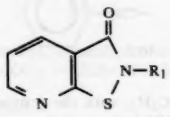
Filed Nov. 23, 1983, Ser. No. 554,699

Claims priority, application Luxembourg, Nov. 26, 1982, 84491

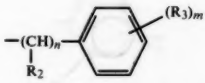
Int. Cl.[4] A61K *31/435*

U.S. Cl. 514—301 **9 Claims**

1. A process for the treatment of acne comprising applying to the area of the skin affected with acne an effective amount of an anti-acne composition comprising in a carrier suitable for topical application to the skin, 0.05 to 10 percent by weight based on the total weight of said composition of an active compound having the formula



wherein R_1 is linear or branched alkyl having 1–12 carbon atoms, mono- or polyhydroxyalkyl having 2–5 carbon atoms, alkenyl having 3–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, or a radical of the formula



wherein n is 0 or 1, m is 1, 2 or 3, R_2 represents hydrogen or lower alkyl having 1–3 carbon atoms and R_3 represents hydrogen, alkyl having 1–4 carbon atoms, nitro, $—CF_3$ or halogen, and

the acid salt thereof with a mineral or organic acid.

4,548,943

ANTIINFLAMMATORY, ANALGESIC, OR ANTI-PRIMARY DYSMENORRHEAL ARYLMETHYLENE- AND ARYLMETHYLINDENOIMIDAZOLES

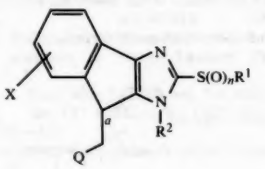
Michael Finizio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 11, 1984, Ser. No. 609,313

Int. Cl.[4] A61K *31/415*; C07D *235/02, 401/06*

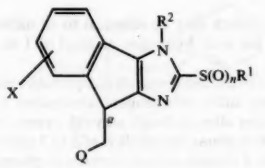
U.S. Cl. 514—393 **19 Claims**

1. A compound of the formula:



(Ia)

or



(Ib)

where

n is 0, 1 or 2;

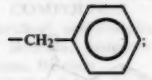
R^1 is C_1–C_2 alkyl, CF_3 or CF_2CHF_2;

R^2 is H, C_1–C_2 alkyl, $CH(R^3)OR^4$, 2-tetrahydrofuranyl, 2-tetrahydropyranyl, $COOR^4$ or COR^5;

where

R^3 is H or CH_3;

R^4 is CH_3, C_2H_5 or

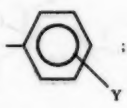


and

R^5 is CH_3 or C_2H_5; with the proviso that when R^2 is $COOR^4$ or COR^5, then n is 0;

a is a single bond or a double bond having either the E or Z configuration with the proviso that when the double bond is Z, then n is 1 or 2;

Q is pyridyl, thienyl or



and

X and Y are independently H, F, Cl, Br, NO_2, OCH_3, OC_2H_5, $N(C_1$–C_2 alkyl)$_2$, CH_3, C_2H_5 or $S(O)_mC_1$–C_2 alkyl where m is 0, 1 or 2; or

a pharmaceutically acceptable acid salt thereof when n is 0 or metal salt thereof when n is 2 and R^2 is H.

11. A method for treating inflammation or primary dysmenorrhea in a mammal which comprises administering to the mammal an effective amount of at least one compound of claim 1.

4,548,944

GUANIDINO-HETEROCYCLYL-PHENYL-AMIDINES AND SALTS THEREOF

Giuseppe Bietti, Milan; Enzo Cereda, Tortona; Arturo Donetti, Milan; Piero del Soldato, Monza; Antonio Giachetti, and Rosamaria Micheletti, both of Milan, all of Italy, assignors to Istituto de Angeli S.p.A., Milan, Italy

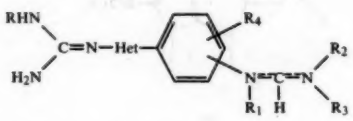
Filed Feb. 10, 1983, Ser. No. 465,572

Claims priority, application Italy, Mar. 24, 1982, 20356 A/82

Int. Cl.[4] C07D *277/42;* **A61K** *31/425*

U.S. Cl. 514—363 **20 Claims**

1. A compound of the tautomeric formula



wherein

R, R_1 and R_2, which may be identical to or different from each other, are each hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 is straight or branched lower alkyl, optionally interrupted by an oxygen, sulfur or nitrogen heteroatom; straight or branched lower alkenyl; lower alkynyl; cyano; cycloalkyl of 3 to 7 carbon atoms; (cycloalkyl of 3 to 7 carbon atoms) (alkyl of 1 to 4 carbon atoms); norbornyl; phenyl; or a 5- to 6-membered ring comprising carbon atoms and one to two nitrogen, oxygen or sulfur heteroatoms; or

R_2 and R_3, together with each other and the nitrogen atom to which they are attached, are pyrrolidino, morpholino or piperidino;

R_4 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; and

Het is a thiazole, oxazole, 1,2,4-thiadiazole, 1,3,4-thiadiazole or 1,2,4-oxadiazole ring;

a tautomer thereof, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,548,945

FUNGICIDALLY ACTIVE SUBSTITUTED 1-HYDROXYETHYL-TRIAZOLYL DERIVATIVES

Graham Holmwood; Jörg Stetter, both of Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen, and Hans Scheinpflug, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

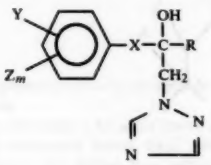
Filed Sep. 21, 1983, Ser. No. 534,233

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237400

Int. Cl.[4] A01N *43/64, 59/16;* **C07D** *249/08;* **C07F** *3/00*

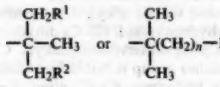
U.S. Cl. 514—383 **8 Claims**

1. A substituted 1-hydroxyethyl-triazolyl derivative of the formula



in which

R represents isopropyl, or represents cyclopropyl, cyclopentyl or cyclohexyl, in each case optionally mono-, di- or tri-substituted by identical or different substituents from the group consisting of methyl, ethyl, isopropyl, methoxy and ethoxy, or represents phenyl which is optionally mono-, di- or tri-substituted by identical or different substituents from the group consisting of fluorine, chlorine, methyl, trifluoromethyl, phenyl and chlorophenyl, or represents the grouping



wherein

R^1 represents hydrogen, fluorine or chlorine;

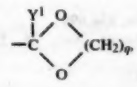
R^2 represents fluorine or chlorine;

R^3 represents methyl, ethyl, propyl, methoxy, ethoxy, methylthio, ethylthio, trifluoromethoxy, trifluoromethylthio, vinyl, methoxycarbonyl, ethoxycarbonyl or cyano, or represents phenyl, phenoxy, phenylthio, phenylmethoxy or phenylmethylthio, it being possible for the last five radicals mentioned to be substituted by fluorine, chlorine, methyl, ethyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, dimethylamino, methoxycarbonyl and ethoxycarbonyl; and

n represents the number 0, 1 or 2;

X represents the grouping $—OCH_2—$, $—SCH_2—$, $—(CH_2)_p$ or —CH=CH—;

Y represents the grouping —CO—Y^1, $—C(OR^4)_2—Y^1$ or



or the grouping $—C(Y^1)=N—OY^2$;

Y^1 represents hydrogen, methyl, ethyl or isopropyl, or represents phenyl, which is optionally mono- or di-substituted by identical or different substituents from the

group consisting of fluorine, chlorine methyl and trifluoromethyl;

Y^2 represents hydrogen, methyl, ethyl, n-propyl, n-butyl, allyl or propargyl, or represents benzyl which is optionally mono- or di-substituted by identical or different substituents from the group consisting of fluorine, chlorine, methyl, trifluoromethyl and trifluoromethoxy;

R^4 represents methyl, ethyl or propyl;

q represents the number 2 or 3;

Z represents fluorine, chlorine, bromine, methyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy or trifluoromethylthio,

m represents the number 0, 1 or 2; and

p represents the number 0, 1 or 2,

or an addition product thereof with an acid or metal salt.

6. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim **1** in admixture with a diluent.

4,548,946

ANTIINFLAMMATORY AND/OR ANALGESIC 1,8-DIHYDRO-(OR 3,8-DIHYDRO)-8-ARYL-2-[(SUBSTITUTED)THIO]-INDENO[1,2-D]IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

Michael Finizio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

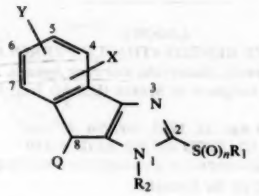
Continuation-in-part of Ser. No. 248,010, Mar. 26, 1981, abandoned. This application Feb. 22, 1982, Ser. No. 349,201

Int. Cl.[4] **A61K** *31/415;* **C07D** *235/02*

U.S. Cl. 514—393 **15 Claims**

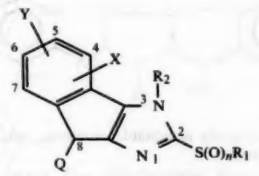
1. A compound of the formula:

(Ia)



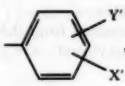
or

(Ib)



where

Q is

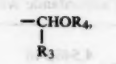


pyridyl or thienyl;

n is 0, 1 or 2;

R_1 is alkyl of 1 or 2 carbon atoms, or mono- or poly-haloalkyl of 1 or 2 carbon atoms;

R_2 is H, C_1–C_6 alkyl,



2-tetrahydropyranyl, 2-tetrahydrofuranyl, 4-nitrobenzyl, $—COOR_5$, $—COR_5$, —COAr or $—SO_2Ar$

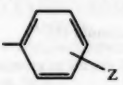
where

R_3 is H or methyl;

R_4 is alkyl of 1–2 carbon atoms, benzyl, $—CH_2CH_2OCH_3$ or $—COR_5$;

R_5 is alkyl of 1–4 carbon atoms, or benzyl;

Ar is



where Z is H, F, Cl, Br, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms or nitro; with the proviso that when R_2 is 4-nitrobenzyl, n is 2 and when R_2 is $—COOR_5$, $—COR_5$, —COAr or $—SO_2Ar$, n is 0;

X, Y, X′ and Y′ are independently H, F, Cl, Br, NO_2, alkoxy of 1 or 2 carbon atoms, $—N(C_{1\text{-}2}\ alkyl)_2$, alkyl of 1 or 2 carbon atoms, $—S(O)_mC_{1\text{-}2}$ alkyl where m is 0, 1 or 2; or

a pharmaceutically suitable acid addition salt thereof when n is 0 or when X, Y, X′ or Y′ is $—N(C_{1\text{-}2}\ alkyl)_2$ or when Q is pyridyl; or

a pharmaceutically suitable metal salt thereof when n is 1 or 2 and R_2=H.

15. A method of treating inflammation, pain or both in a mammal which comprises administering to the mammal an effective antiinflammatory or analgesic amount of at least one compound of claim **1** or claim **2** or claim **3** or claim **4** or claim **5** or claim **6** or claim **7** or claim **8** or claim **9** or claim **10** or claim **11** or claim **12** or claim **13**.

4,548,947

1-(SUBSTITUTED-ARYL)-DIHYDRO-1H-PYRROLIZINE-3,5-[2H,6H-]DIONES AND USE FOR REVERSING AMNESIA

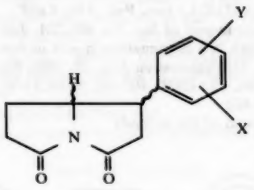
Donald E. Butler, and Anthony J. Thomas, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 7, 1984, Ser. No. 607,375

Int. Cl.[4] **A61K** *31/40;* **C07P** *487/06*

U.S. Cl. 514—413 **17 Claims**

1. A compound having the structural formula:



wherein X and Y are independently hydrogen, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, chloro- or trifluoromethyl.

16. A pharmaceutical composition for reversing electroconvulsive shock induced amnesia including an effective amount of a compound in accordance with claim **1** in combination with a pharmaceutically acceptable carrier.

17. A method of reversing electroconvulsive shock induced amnesia in a mammal comprising administering to said mam-

mal in need of such treatment an effective amount of a pharmaceutical composition in accordance with claim 16.

4,548,948

ANTI-INFLAMMATORY AND ANALGESIC BENZOTHIOPHENE AND BENZAFURAN DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Robert W. Ward, Harlow; Stephen A. Smith, Bishops Stortford, and Roger E. Markwell, Great Dunmow, all of England, assignors to Beecham Group p.l.c., Middlesex, England

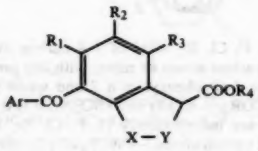
Filed Feb. 17, 1984, Ser. No. 581,440

Claims priority, application United Kingdom, Feb. 19, 1983, 8304647; Jul. 27, 1983, 8320182; Nov. 5, 1983, 8329607

Int. Cl.[4] A61K *31/34, 31/38, 31/40;* **C07D** *333/38*

U.S. Cl. 514—422 **13 Claims**

1. A compound of formula (I):



(I)

wherein:

Ar is phenyl optionally substituted in the o-, m- or p-position by C_{1-4} alkyl, C_{1-4} alkoxy, trifluoromethyl, bromo, chloro or fluoro,

pyrryl optionally N-substituted by C_{1-4} alkyl,

2-furyl or 2-thienyl either optionally substituted in the 3-, 4- or 5-position by methyl, chloro or bromo, or

3-furyl or 3-thienyl;

X is oxygen, sulphur, sulphoxide or sulphone, Y is methylene, R_1 and R_3 are hydrogen or C_{1-4} alkyl, and R_2 is hydrogen, C_{1-4} alkyl, fluoro, chloro or bromo, or X is methylene, Y is oxygen, R_1 and R_3 are both hydrogen, and R_2 is hydrogen, fluoro, chloro or bromo; and

R_4 is hydrogen or C_{1-4} alkyl, or a salt thereof.

12. An anti-inflammatory composition, which comprises an anti-inflammatory effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,548,949

±2-[(3,4-METHYLENEDIOXY)PHENETHYL]-5-[(3-CARBOXAMIDO-4-HYDROXY)-α-HYDROXYBENZYL]PYRROLIDINES

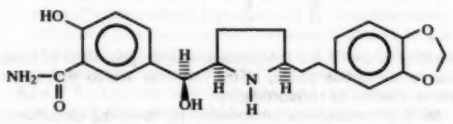
Joseph M. Muchowski, Sunnyvale, Calif.; Robert Greenhouse, Mexico City, Mexico; Jack Ackrell, Palo Alto, Calif.; Tsung-Tee Li, and Jurg R. Pfister, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 460,204, Jan. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 285,892, Jul. 22, 1981,. This application Aug. 29, 1983, Ser. No. 527,716

Int. Cl.[4] C07D *405/06;* **A61K** *31/40*

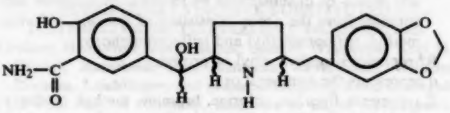
U.S. Cl. 514—422 **9 Claims**

1. A compound of the formula



namely, ±2-[(3,4-methylenedioxy)phenethyl]-5-[(3-carboxamido-4-hydroxy)-α-hydroxybenzyl]pyrrolidine and the pharmaceutically acceptable acid addition salts thereof.

9. A method for regulating hypertension in mammals which method comprises administering to a subject in need of such treatment a therapeutically effective amount of the compound of the formula



or a pharmaceutically acceptable acid addition salt thereof.

4,548,950

PHARMACEUTICAL COMPOSITION

Lily Baxendale, and Siegfried Gottfried, both of Arkley, England, assignors to Biorex Laboratories Limited, London, England

Filed Jun. 6, 1983, Ser. No. 501,396

Claims priority, application United Kingdom, Jun. 30, 1982, 8218857

Int. Cl.[4] A61K *31/215, 31/185*

U.S. Cl. 514—510 **6 Claims**

1. A pharmaceutical composition in the form of a water-containing cream for topical application which contains at least one glycyrrhetinic acid derivative which is:

(a) glycyrrhetinic acid esters thereof;

(b) 3-0-acyl derivatives of glycyrrhetinic acid and esters thereof; or

(c) 2-(ω-carboxyalkanoyl or cycloalkanoyl) oxymethyl-glycyrrhetinic acid derivatives,

together with a stabilising amount for said glycyrrhetinic acid derivative which is at least one non-toxic, water-soluble salt of zinc, calcium or magnesium.

4,548,951

HYPOTENSIVE BENZOXATHIOLE PYRROLIDINES

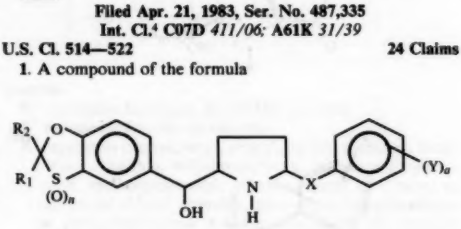
Joseph M. Muchowski, Sunnyvale, and Jack Ackrell, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 21, 1983, Ser. No. 487,335

Int. Cl.[4] C07D *411/06;* **A61K** *31/39*

U.S. Cl. 514—522 **24 Claims**

1. A compound of the formula



and the pharmaceutically acceptable, nontoxic, acid addition salts thereof, wherein

R_1 and R_2 are each independently —H, lower alkyl, or cycloalkyl of 4–7 carbons, with the proviso that R_1 and R_2 cannot both be —H or cycloalkyl at the same time;

R_1 and R_2 taken together are cycloalkyl of 4–7 carbons;

n is 0 or 1;

X is $(CH_2)_2$, CH=CH, or C≡C;

Y is independently selected from the group of —H, —Fl, —Br, —Cl, lower alkyl, and —OR_3; wherein R_3 is —H or lower alkyl; and

a is 1 or 2, or

two Y's taken together are —OCH_2O—.

24. A method for management of hypertension in mammals which method comprises administering to a subject in need of such treatment a therapeutically effective amount of the compound of claim 1.

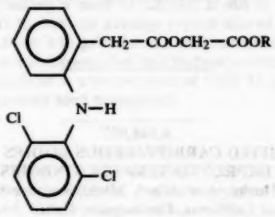
4,548,952

2-[(2,6-DICHLOROPHENYL)AMINO]PHENYLACETOXYACETYL DERIVATIVES AND THERAPEUTIC COMPOSITIONS CONTAINING SAME

Antonio V. Casas, Barcelona, Spain, assignor to Prodes, S.A., San Justo Desvern, Spain

Filed Mar. 15, 1984, Ser. No. 590,018
Claims priority, application Spain, Mar. 21, 1983, 520,813
Int. Cl.[4] A61K *31/24*; C07C *101/447*
U.S. Cl. 514—533 **9 Claims**

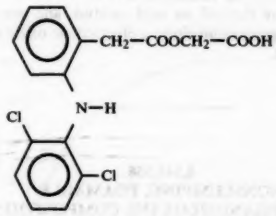
1. A compound of the formula:



wherein R is hydrogen, benzyl, or an organic or inorganic cation capable of forming a therapeutically acceptable monobasic salt.

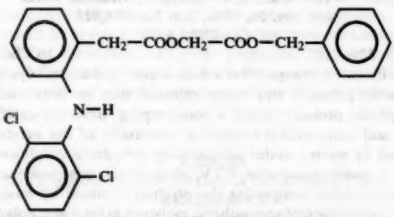
8. A process for the preparation of a compound of the formula:

(IV)



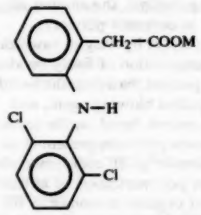
which comprises hydrogenating a compound of the formula:

(I)



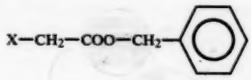
obtained by reacting a compound having the formula:

(II)



wherein M represents a cation, with a compound of the formula:

(III)



wherein X is a halogen, under heating in an anhydrous organic liquid medium of polar and aprotic character, in the presence of an effective amount of a hydrogenation catalyst.

4,548,953

PRODUCTION OF ALKANES FROM MIXTURES OF CO AND H_2

Rocco A. Fiato, Scotch Plains, and Edwin L. Kugler, Glen Gardner, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 511,651, Jul. 7, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 625,170
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—717 **12 Claims**

1. A process for producing hydrocarbons, including alkane hydrocarbons, from gaseous mixtures of CO and H_2 comprising contacting said mixture, at a temperature ranging from about 200° to 350° C. and for a time sufficient to convert at least a portion of said feed to alkane hydrocarbons, with a catalyst comprising a mixture of iron carbide and ilmenite supported on titania wherein the amount of said supported iron present in said supported iron carbide and ilmenite, calculated as Fe_2O_3, is at least about 2×10^{-3} grams per square meter of titania support surface.

4,548,954

FLOOR CLEANING COMPOSITION

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation-in-part of Ser. No. 511,185, Jul. 6, 1983, , said Ser. No. 660,350. This application Dec. 20, 1984, Ser. No. 684,384
Int. Cl.[4] C08J *9/38*
U.S. Cl. 521—52 **12 Claims**

1. A process for preparing an oil absorbent floor cleaning composition comprising:

(a) forming an aqueous reactant phase comprising about 25–70% by weight of abrasive solid particles, about 0.1–5% of the weight of the solid particles of a silane-coupling agent, about 0.1–10% of a nonionic surfactant, about 0.1–20% of a silicone fluid and about 15–40% water;

(b) mixing said aqueous reactant phase with a water-foamable prepolymer resin which contains at least 2 free isocyanate groups per resin molecule so that the final mole ratio of water to total free isocyanate groups is within the range of about 5–100:1, thereby converting said resin into a hydrophilic, open-called, highly reticulated polyurethane foam bun;

(c) shredding said foam bun; and

(d) adsorbing an exterior aqueous phase into said shredded foam.

4,548,955

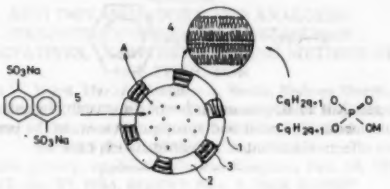
NYLON CAPSULE RESPONDING TO PH

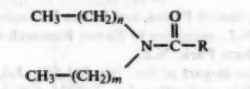
Yoshio Okahata, Kanagawa, and Tokahiro Seki, Tokyo, both of Japan, assignors to Sogo Pharmaceutical Company Limited, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,884
Int. Cl.[4] C08J *9/36*
U.S. Cl. 521—53 **1 Claim**

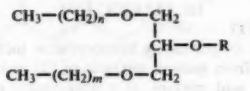
1. A nylon capsule responding to pH, wherein one or more compounds selected from the group consisting of compounds

represented by the following formulas (1)–(5) are applied to the pore portion:

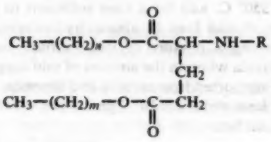




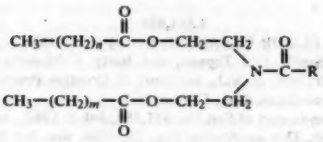
(1)



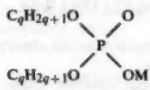
(2)



(3)

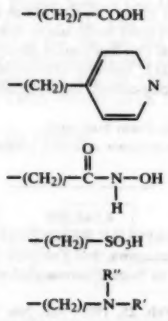


(4)



(5)

wherein n and m independently represent an integer of 9 through 19, R is a member selected from the following groups:



(l is an integer of 1 through 5, and R' and R'' independently represent H or CH_3), q is an integer of 7 through 20, and M represents a metallic atom.

4,548,956

FOAMABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Springs, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 422,766, This application Mar. 18, 1985, Ser. No. 713,373
Int. Cl.[4] C08J 9/18
U.S. Cl. 521—56 **3 Claims**

1. An expandable polymeric styrene particle having incorporated therein a blowing agent, from about 0.2% to about 0.5% by weight of pentaerythritol tetrastearate and from about 1.0% to about 2.0% by weight of hexabromocyclododecane, all percentages being based upon the weight of the polymeric styrene.

4,548,957

DENSIFIED CARBONACEOUS BODIES WITH IMPROVED SURFACE FINISHES

Edward E. Hucke, Ann Arbor, Mich., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 568,066, is a division of Ser. No. 305,777, Sep. 25, 1981, Pat. No. 4,425,316. This application Jan. 9, 1985, Ser. No. 689,842
Int. Cl.[4] C08J 9/02
U.S. Cl. 521—77 **3 Claims**

1. A liquid impregnant for densifying a permeable body composed essentially of a fine grained, isotropic graphite, said impregnant consisting essentially of: furfural or furfural alcohol or a mixture thereof, an acid catalyst, and one or more pore-forming agents comprising a plyethylene oxide adduct of an alkyl phenol.

4,548,958

NONSLUMPING, FOAMABLE POLYORGANOSILOXANE COMPOSITIONS CONTAINING ORGANOSILOXANE GRAFT COPOLYMERS

Therese M. Bauman, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 664,913
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—122 **10 Claims**

1. A foamable composition which is confined under superatmospheric pressure and when released into an area under atmospheric pressure forms a nonslumping, moisture-curable foam, said composition consisting essentially of the product obtained by mixing under substantially anhydrous conditions

(A) a moisture-curable RTV elastomeric organosiloxane composition comprising the product obtained by mixing in the absence of atmospheric moisture at least one polydiorganosiloxane curable in the presence of a moisture reactive crosslinker, a moisture reactive crosslinker and, optionally, a curing catalyst, the amount of said crosslinker being sufficient to cure said polymer;

(B) from 12 to 50 percent by weight, based on the weight of said foamable composition of finely divided silica;

(C) from 20 to 50 percent, based on the weight of said composition of a liquified blowing agent; and

(D) from 5 to 80 percent, based on the combined weight of all diorganosiloxane polymers present in said composition, of an organosiloxane graft copolymer obtained by the peroxide catalyst polymerization of at least one ethylenically unsaturated organic monomer in the presence of a liquid, hydroxyl endblocked polydiorganosiloxane.

4,548,959

HYDROXYAPATITE, CERAMIC MATERIAL AND PROCESS FOR PREPARING THEREOF

Hirosi Nagai, Chofu, and Yasushi Nishimura, Tokyo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Division of Ser. No. 318,020, Nov. 4, 1981, Pat. No. 4,448,758, which is a division of Ser. No. 188,832, Sep. 19, 1980, Pat. No. 4,330,514. This application Oct. 25, 1983, Ser. No. 545,182
Claims priority, application Japan, Sep. 25, 1979, 54-123000
Int. Cl.[4] A61K *6/08*; C04B *35/00*
U.S. Cl. 523—115 5 Claims

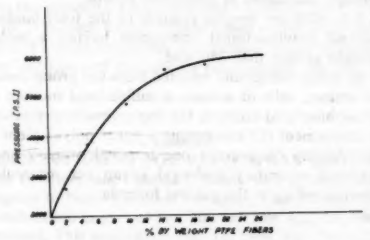
1. A ceramic material consisting essentially of hydroxyapatite ceramic having a ratio of calcium atoms to phosphorus atoms of 1.67 to 1.69, an average crystal size of 4 to 20μ, a density of 3.14 to 3.16 g/cm^3 and a thermal stability wherein whitlockite is not shown after said hydroxyapatite ceramic is heated for one hour at a temperature of 1350° C., said ceramic being colourless or semi transparent.

4,548,960

PIPE JOINTING COMPOUNDS

Herbert W. Bentley, Sylvania, Australia, assignor to UNASCO Pty. Limited, Girraween, Australia

Continuation-in-part of Ser. No. 254,241, Apr. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 85,135, Oct. 15, 1979, abandoned. This application Nov. 23, 1983, Ser. No. 554,778
Claims priority, application Australia, Oct. 17, 1978, PD6405
Int. Cl.[4] C08K *3/04*, *3/10*
U.S. Cl. 523—176 11 Claims



1. A pipe jointing or thread sealant composition in paste form comprising from 2 to 25% by weight of synthetic fibres selected from the group consisting of polytetrafluoroethylene (PTFE), fluorinated ethylene/propylene polymer (FEP), polyolefins and mixtures of such fibres, together with from 25% to 60% of a liquid carrier and 20 to 50% of a pulverulent filler.

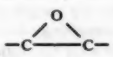
4,548,961

EPOXY RESIN COMPOSITIONS OF ENHANCED CREEP RESISTANCE

S. Frank Rey, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 428,832, Sep. 30, 1982, Pat. No. 4,497,764. This application Feb. 4, 1985, Ser. No. 698,054
Int. Cl.[4] C08K *3/36*
U.S. Cl. 523—220 7 Claims

1. An epoxy resin composition comprising:
(a) an epoxy resin having at least two



groups per molecule;
(b) a diglycidyl ether of cyclohexane dimethanol;
(c) triethylene tetraamine in a sufficient amount to cure said epoxy resin at about room temperature; and,
(d) a major amount of an aggregate filler having a particulate size ranging from 5 to 400 mesh.

4,548,962

RUBBERIZED ASPHALTIC CONCRETE COMPOSITION

Gustaf Lindmark, Botsmark, Sweden, assignor to All Seasons Surfacing Corporation, Bellevue, Wash.

Continuation-in-part of Ser. No. 335,582, Dec. 29, 1981, abandoned. This application May 17, 1984, Ser. No. 611,518
Int. Cl.[4] C08L *95/00*
U.S. Cl. 523—220 15 Claims

1. An asphaltic composition consisting essentially of:
1 to 6 percent by weight of rubber granulate, the majority of which comprises granules in the size range of from ¼ inch to No. 10 U.S. Sieve size,
82 to 93 percent by weight of mineral aggregate composed of particles wherein 100 percent of said particles are less than ¾ inch, 50 to 62 percent are less than ⅜th inch, 30 to 44 percent are less than ¼ inch, 20 to 32 percent are less than No. 10 U.S. Sieve size, 12 to 23 percent are less than No. 30 U.S. Sieve size and 7 to 11 percent are less than No. 200 U.S. Sieve size, the particles in the size range from ¼ inch to No. 10 U.S. Sieve size thereby being reduced by an amount substantially equal in volume to the amount of said rubber granulate to receive in admixture said rubber granulate to form a total aggregate mixture, and
6 to 12 percent by weight of asphalt binder.

4,548,963

INTERNALLY CROSSLINKABLE ACRYLIC POLYMERS AND DIGLYCIDYL ESTERS OF DIBASIC ACIDS

Stephen L. Cluff, Baton Rouge, La.; Clifford H. Strolle, Springfield, Pa., and Robert D. Breazeale, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1984, Ser. No. 637,579
Int. Cl.[4] C08F *220/20*
U.S. Cl. 523—427 5 Claims

1. An enamel composition comprising
a. about from 35 to 75% by weight solids made up of
(1) about from 80 to 50% by weight polymer prepared from a monomer blend comprising
A. about from 10 to 40 weight percent of a hydroxy alkyl ester of acrylic or methacrylic acid wherein the alkyl group has from 2–10 carbon atoms,
B. about from 10 to 40% of at least one glycidic monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether, and
C. about from 20 to 80% by weight of at least one ethylenically unsaturated monomer polymerizable with the hydroxyl alkyl ester and the glycidic monomer,
and
(2) about from 20 to 50% by weight diglycidyl ester of an aliphatic or alicyclic dibasic acid having from 2 to 12 carbon atoms,
b. about from 60 to 20% by weight of solvent, and
c. about from 0.1 to 5.0% by weight crosslinking catalyst,
and wherein the resulting polymer has a hydroxyl content of about from 2 to 6% by weight, and the ratio of epoxy to hydroxy units is at least about 0.5:1.

4,548,964
FLAME-RETARDANT POLYESTER RESIN COMPOSITION

Tomohiko Yoshida, Kamakura, and Hiroshi Mori, Iwakuni, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,639
Claims priority, application Japan, Dec. 27, 1983, 58-248618
Int. Cl.[4] C08K 5/10
U.S. Cl. 523—455 **4 Claims**

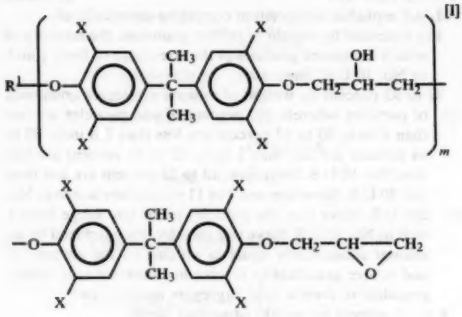
1. A flame-retardant polyester resin composition comprising

(1) a reinforced resin composition obtained by melt blending

(A) a polyethylene terephthalate resin,

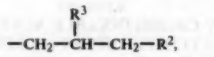
(B) glass fibers,

(C) at least one flame retarder of the general formula



[I]

where X independently represents a hydrogen, chlorine or bromine atom, m has an average value of 0 to 11, and R^1 represents a glycidyl radical, a radical of the formula



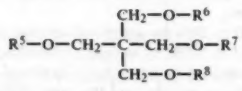
a hydrocarbon radical, a halogenated hydrocarbon radical or a radical of the formula $—COR^4$ where one of R^2 and R^3 is a hydroxyl group and the other is an alkoxy, phenoxy, amino or carboxyl group which may have one or more halogen substituents, and R^4 is a hydrocarbon or halogenated hydrocarbon radical, the flame retarder having a halogen content of not less than 10% by weight.

(D) hexabromobiphenyl ether, and

(E) antimony trioxide,

the reinforced resin composition containing, per 100 parts by weight of component (A), 1 to 20 parts by weight of the component (C), 2 to 30 parts by weight of component (D) and 2 to 30 parts by weight of component (E), the weight ratio of component (C) to component (D) being in the range of $0.2 < (C)/(D) \leqq 4$ and the combined amount of components (C) and (D) being 3 to 40 parts by weight, the content of component (B) being 5 to 60% by weight based on the weight of the reinforced resin composition; and

(2) (G) at least one ester compound subsequently added to the reinforced resin composition in an amount of 0.01 to 2% by weight based on the weight of the reinforced resin composition, the ester compound being of the formula



[II]

where R^5 to R^8 are hydrogen atoms or alkanoyl radicals of the formula $—COC_nH_{2n+1}$ (n = 10–30), provided that not all of R^5 to R^8 are hydrogen atoms.

4,548,965
WATER-DISPERSIBLE BINDERS FOR CATIONIC ELECTROCOATING FINISHES, AND PROCESS FOR THEIR PREPARATION

Michael Geist, Münster; Horst Diefenbach, Nottuln, and Arnold Dobbelstein, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

PCT No. PCT/DE84/00003, § 371 Date Aug. 31, 1984, § 102(e) Date Aug. 31, 1984, PCT Pub. No. WO84/02712, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 5, 1985, Ser. No. 648,171
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1983, 3300545
Int. Cl.[4] C09D 5/40; C08G 59/14; C09D 3/58, 5/02
U.S. Cl. 523—456 **18 Claims**

1. In a water-dispersible binder for cationic electrocoating finishes comprising the reaction products of:

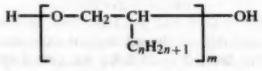
(A) low molecular weight epoxide resins containing aromatic groups and having an epoxide equivalent weight of below 375;

(B) a first polyfunctional compound having a molecular weight below 350 selected from the group consisting of polyfunctional alcohols and carboxylic acids, said polyfunctional alcohols selected from the group consisting of aliphatic polyfunctional alcohols and alicyclic polyfunctional alcohols, whereby from (A) and (B) a first reaction product is obtained, containing 10–45% of aromatic groups, calculated as phenylene groups;

(C) 5 to 40% by weight, relative to the total binder of a second polyfunctional compound having a molecular weight greater than 350; and

(D) an amine compound selected from the group consisting of amines, salts of amines, a sulfide/acid mixture and a phosphine/acid mixture, the improvement comprising:

said component (C) comprising a linear polyalkylene ether diol having on average one terminal primary and one terminal secondary hydroxyl group per molecule and corresponding to the general formula



wherein n is 1 to 4 and m is 4 to 35.

4,548,966
ASPHALT EMULSION

Richard B. Moore, Chattanooga, Tenn., assignor to Polysar Financial Services S.A., Canton of Fribourg, Switzerland

Filed Aug. 8, 1984, Ser. No. 638,790
Int. Cl.[4] C08L 3/14, 9/04, 9/10, 95/00
U.S. Cl. 524—53 **19 Claims**

1. A method of adjusting the viscosity of an asphalt emulsion having a pH up to about 10 to at least about 75 Saybolt seconds at 122° F. which comprises adding to said emulsion from about 0.05 to 1 percent by weight of a cross-linked starch consisting of not more than about 27 percent amylose and the balance substantially amylopectin.

2. A method according to claim 1 wherein said aqueous asphalt emulsion further comprises up to about 10 percent by dry weight based on the dry weight of asphalt, of a latex selected from the group consisting of:

(a) a homopolymer of a C_4–C_6 conjugated diolefin;

(b) a copolymer of

(i) from about 40 to 20 weight percent of a C_{8-12} vinyl or vinylidene aromatic monomer which may be unsubsti-

tuted or substituted by a straight or branched chain C_{1-4} alkyl radical or a chlorine or bromine atom;

(ii) from about 60 to about 80 weight percent of a C_{4-6} conjugated diolefin;

(iii) from 0 to about 10 weight percent of a C_{3-9} ethylenically unsaturated carboxylic acid or a C_{1-4} alkyl or alkanol ester thereof or an amide derivative thereof which may be unsubstituted or substituted at the N atom by up to 2 C_{1-4} alkyl or alkanol radicals; and

(c) a copolymer of

(i) up to about 40 weight percent of a C_{3-6} alkenyl nitrile; and

(ii) the balance a C_{4-6} conjugated diolefin.

12. A composition comprising a latex having a pH up to about 10 and selected from the group consisting of:

(a) a homopolymer of a C_4–C_6 conjugated diolefin;

(b) a copolymer of

(i) from about 40 to 20 weight percent of a C_{8-12} vinyl or vinylidene aromatic monomer which may be unsubstituted or substituted by a straight or branched chain C_{1-4} alkyl radical or a chlorine or bromine atom;

(ii) from about 60 to about 80 weight percent of a C_{4-6} conjugated diolefin;

(iii) from 0 to about 10 weight percent of a C_{3-9} ethylenically unsaturated carboxylic acid or a C_{1-4} alkyl or alkanol ester thereof or an amide derivative thereof which may be unsubstituted or substituted at the N atom by up to 2 C_{1-4} alkyl or alkanol radicals; and

(c) a copolymer of

(i) up to about 40 weight percent of a C_{3-6} alkenyl nitrile; and

(ii) the balance a C_{4-6} conjugated diolefin;

and 1 to 15 percent by dry weight based on the dry weight of the latex of a cross-linked starch consisting of not more than 27 percent amylose and the balance substantially amylopectin.

4,548,967

MASKING AGENT FOR PAINT SPRAY BOOTHS

William B. Brown, and Cynthia E. Davis, both of Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 602,239, Apr. 19, 1984, abandoned. This application Jun. 15, 1984, Ser. No. 621,299

Int. Cl.[4] C08L *5/00*; C08K *5/15*

U.S. Cl. 524—56 **6 Claims**

1. A masking composition comprising:

Ingredients	% by weight
Water	30–50
Polyvinylpyrrolidone	2–30
A saccharide, from the group consisting of monosaccharides, disaccharides, and corn syrup	16–60
Water-soluble plasticizer	0–10.

6. A method for protecting surfaces of paint spray booths from the adherance of oil-based coatings which comprises coating such surfaces prior to the application of such oil-based coatings with a composition comprising:

Ingredients	% by weight
Water	40–46
Polyvinylpyrrolidone	8–12
A saccharide, from the group consisting of monosaccharides, disaccharides, and corn syrup	32–41
Water-soluble surfactant	.01–0.75
Water-soluble plasticizer	3–7.

4,548,968

MANUFACTURE OF RESIN EXTENDED PIGMENTS

Edward E. Jaffe, Wilmington, Del., assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 482,596, Apr. 6, 1983, Pat. No. 4,478,968. This application Jun. 1, 1984, Ser. No. 624,176

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.[4] C08K *5/34, 5/56*; C09J *3/20*; C09C *3/10*

U.S. Cl. 524—88 **9 Claims**

1. A process comprising dry milling a crude organic pigment to a low-crystallinity state in the presence of from 10 to 75% by weight based on pigment of a water-insoluble thermoplastic resin followed by milling the thus obtained product in water at pH 7–14.

4,548,969

CROSS-LINKABLE ROTATIONAL MOLDING COMPOSITIONS

Melvin F. Maringer, Cincinnati, Ohio, and Fred K. Morgan, Cold Springs, Ky.

Filed May 23, 1983, Ser. No. 497,313

Int. Cl.[4] C08F *8/00*

U.S. Cl. 524—94 **18 Claims**

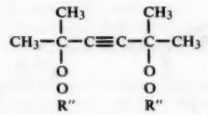
1. An ethylene polymer composition capable of being cross-linked during rotational molding which comprises:

(a) a linear polymer of ethylene having a density of above about 0.94, said polymer having been prepared by particle form polymerization in the presence of a catalyst composition comprising:

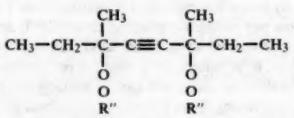
(i) the solid reaction product of (1) at least one nonhalide containing organic oxygenated compound of a metal selected from the metals of Groups Ia, IIa, IIb, IIIa, IVa, VIIb and VIII of the Periodic Table, with (2) at least one nonhalide containing organic oxygenated transition compound of a transition metal selected from the metals of Groups IVb, Vb, and VIb of the Periodic Table, and with (3) an organo aluminum halide having the general formula $AlR_nR'_{3-n}$ in which R is a hydrocarbon radical containing 1 to 20 carbon atoms, R' is a halide and n is any number such that $1 \leqq n \leqq 2$; and

(ii) an organo-metallic compound selected from the organic derivatives of metals of Groups Ia, IIa, IIb, IIIa and IVa of the Periodic Table, and,

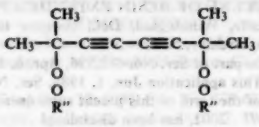
(b) a crosslinking effective amount of an acetylenic high molecular weight diperoxy compound selected from the group consisting of hexynes having the formula



octynes having the formula



and octynes having the formula



where R'' is selected from the group consisting of tertiary alkyl, alkyl carbonate and benzoate.

4,548,970

POLYAMIDEIMIDES PREPARED BY REACTING EITHER LACTAMS OR POLYAMIDES WITH POLYISOCYANATES AND ANHYDRIDES USING A LACTAM AS AN ADDITIVE

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

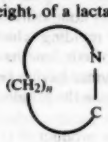
Filed Aug. 27, 1984, Ser. No. 644,708

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332033

Int. Cl.[4] C08L *79/08*

U.S. Cl. 524—98 **5 Claims**

1. Polyamide imide polymers obtained from condensation of (1) polyisocyanates, (2) cyclic polycarboxylic acid anhydrides and (3) a member selected from lactams, polyamides, or a mixture thereof characterized in that the polymers contain from 0.1 to 20%, by weight, of a lactam of the formula



wherein

n is the number 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 or 18.

4,548,971

POLYMER COMPOSITIONS

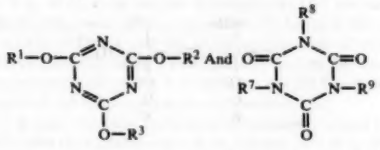
Robert J. Martinovich; Ronald D. Mathis, and Roger T. Shiflet, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 30, 1984, Ser. No. 626,842

Int. Cl.[4] C08K *3/22, 3/40, 5/34;* **C08L** *81/04*

U.S. Cl. 524—101 **19 Claims**

1. A composition comprising normally solid arylene sulfide polymer and at least one of cyanurate and isocyanurate compounds having structural formulas selected from:



wherein R^1, R^2, R^3 are the same or different hydrocarbyl or substituted hydrocarbyl radicals containing from 1 to about 12 carbon atoms per molecule selected from alkyl, aryl, alkaryl, allyl and hydrocarbyl-substituted allyl radicals of the type $-CH_2CR^4{=}CR^5R^6$ where R^4 is methyl or hydrogen, R^5 and R^6 are preferably the same and can be hydrogen or alkyl, aryl and alkaryl containing from 1 to about 10 carbon atoms and R^7, R^8, R^9 can be the same or different hydrocarbyl in an amount sufficient to increase melt flow relative to the polymer absent any additive and thereby improve the processability of said composition.

4,548,972

FLAME RETARDANT POLYAMIDE COMPOSITIONS

Ian G. Williams, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 29, 1984, Ser. No. 584,906

Claims priority, application United Kingdom, Mar. 17, 1983, 8307408

Int. Cl.[4] C08L *77/00;* **C08K** *5/34*

U.S. Cl. 524—100 **6 Claims**

1. A reinforced, fire retardant, polyamide composition characterised in that it contains:

(a) at least 35% by weight of a fibre-forming polyamide,

(b) 15 to 30%, by weight of glass fibres or particulate fillers,

(c) 15 to 30%, by weight of melamine demi-sulphate,

(d) at least 2.5% but no more than 10%, by weight of a halogenated compound selected from the condensation product of 2 moles chlorocyclopentadiene and 1 mole of 1,5-cylooctadiene, brominated polystyrene, brominated polyphenylene oxide or a brominated epoxy resin, and

(e) a synergist selected from at least one of zinc borate, zinc oxide and mixtures of antimony oxide and zinc borate, wherein the concentration of oxide present is between 0 and 5%, the concentration of zinc borate is between 0 and 25%, and the total weight of synergist is at least 1by weight and wherein the weight percentages of the constitutents (a), (b), (c), (d) and (e) total 100%.

4,548,973

SELECTED 2,2,6,6-TETRAMETHYL-4-PIPERIDINYL DERIVATIVES AND THEIR USE AS LIGHT STABILIZERS

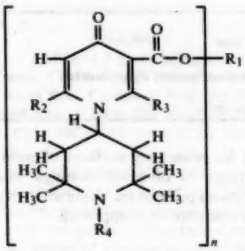
Robert J. Raynor, North Branford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Aug. 27, 1984, Ser. No. 644,423

Int. Cl.[4] C08K *5/34;* **C07D** *251/00*

U.S. Cl. 524—102 **7 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidinyl derivative having a formula comprising:



wherein R_1 is hydrogen, an alkyl or alkylene group having 1 to about 8 carbon atoms, or cycloalkyl or aryl groups having about 5 or 6 ring carbon atoms; R_2 and R_3 are individually selected from hydrogen, alkyl groups having 1 to about 8 carbon atoms, and cycloalkyl and aryl groups having about 5 or 6 ring carbon atoms; R_4 is selected from hydrogen and alkyl groups having 1 to about 8 carbon atoms; and n is either 1 or 2.

4,548,974

ANTIBIOTICS PRODUCED BY *KIBDELOSPORANGIUM ARIDUM* SHEARER

Betty A. Bowie, Havertown; David J. Newman, Wayne; Marcia C. Shearer, Conshohocken; Robert D. Sitrin, Plymouth Meeting, and Joseph R. Valenta, Strafford, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jul. 13, 1983, Ser. No. 513,513
Int. Cl.[4] A61K *35/74*; C12P *1/06*
U.S. Cl. 424—118 24 Claims

1. An enriched AAD 216 complex which at a pH of about 6 has the following characteristics:

(a) pale-white-yellow solid which decomposes at 300° to 350° C.;

(b) an approximate elemental composition of 53.22 percent carbon, 6.14 percent hydrogen, 3.73 percent nitrogen and 0.28 percent ash;

(c) an infrared spectrum in potassium bromide which exhibits peaks at the following wave numbers in cm^{-1}: 3400, 2920, 1660, 1600, 1510, 1460, 1430, 1390, 1320, 1240, 1150, 1060 and 1020;

(d) an ultraviolet spectrum in acetonitrile:water (1:1) which exhibits an absorption maximum at 280 nm under neutral and acid conditions with an $E_{1\%}=43.9$ and at 301 nm under basic conditions with an $E_{1\%}=56.8$;

(e) a positive reaction with periodate and negative reaction with ninhydrin; and

(f) soluble in H_2O, methanol, dimethylsulfoxide and dimethylformamide and insoluble in ethanol, acetonitrile, acetone, diethylether and aliphatic hydrocarbons.

4,548,975

DISCOLORATION-RESISTANT SPANDEX FIBER

William Lewis, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1983, Ser. No. 535,688
Int. Cl.[4] D02G *3/00*
U.S. Cl. 524—147 13 Claims

1. In a spandex fiber containing a phenolic antioxidant and a phosphite, the improvement comprising for increased resistance to smog- or heat-induced discoloration, an effective amount of a dialkyl phenyl phosphite in which at least half of the alkyl groups are branched at the alpha position and the phenyl groups are unsubstituted or monoalkyl substituted.

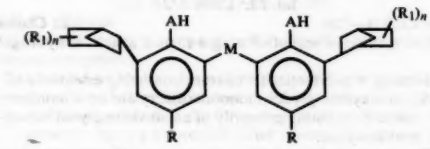
4,548,976

BIS-(NORBORNYL OR SUBSTITUTED NORBORNYL) DERIVATIVES OF A PHENOL OR A PHENYLAMINE, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING SAME

Pierre DeRoche, Horgen, Switzerland, and Neil V. Kirby, Wisbech, England, assignors to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1984, Ser. No. 611,807
Int. Cl.[4] C08K *5/13*, *5/18*, *5/36*; C07C *39/11*
U.S. Cl. 524—249 6 Claims

1. A bis-(norbornyl or substituted norbornyl) derivative of a phenol or a phenylamine of the formula:



wherein each A is independently O or NH; M is a bivalent radical; each R is independently a hydrocarbyl or substituted hydrocarbyl group which permits the addition of the norbornene at the ortho position with respect to AH, each R_1 is independently a hydrocarbyl or a substituted hydrocarbyl group and each n is independently from 0 to 3.

4,548,977

POLYMER SLURRY PREPARATION

Aubrey South, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1984, Ser. No. 679,141
Int. Cl.[4] C08K *5/10*
U.S. Cl. 524—310 8 Claims

1. A process for producing poly(arylene sulfide) slurries suitable for coating and molding comprising:

(a) combining 100 weight parts solid poly(arylene sulfide) resin with at least about 0.5 weight parts of at least one nonionic surfactant under conditions to produce an intimate admixture, and

(b) blending the admixture obtained in (a) with a reinforcing material in a liquid diluent medium.

4,548,978

FAST CRYSTALLIZING POLYESTER RESIN CONTAINING THREE-COMPONENT CRYSTALLIZATION SYSTEM

William E. Garrison, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

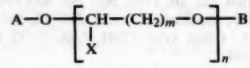
Continuation-in-part of Ser. No. 582,991, Feb. 24, 1984,. This application Feb. 22, 1985, Ser. No. 704,532
Int. Cl.[4] C08L *67/02*, *71/02*
U.S. Cl. 524—314 36 Claims

1. A molding composition comprising

(A) 20–90% by weight based on the total of components A, B, C, D and E of a matrix resin having an inherent viscosity of at least 0.4, said matrix resin being selected from the group consisting of polyethylene terephthalate homopolymers, polyethylene terephthalate/polybutylene terephthalate mixtures, polyethylene terephthalate/polybutylene terephthalate copolymers, and mixtures thereof, wherein said polyethylene terephthalate/polybutylene terephthalate copolymers and mixtures contain at least 70% by weight ethylene terephthalate units,

(B) 1–15 parts by weight per hundred parts of matrix resin (A) of polyalkylene oxide soft segments incorporated into the polymer chain of matrix resin A, said polyalkylene oxide soft segments having a molecular weight of 200–3250,

(C) 1–15 parts by weight per hundred parts of matrix resin (A) of a plasticizer of the formula



where

m is an integer from 1 to 3, inclusive,

n is an integer from 4 to 25, inclusive,

A is alkyl, acyl or aroyl of 1–10 carbon atoms,

B is alkyl, acyl or aroyl of 1–10 carbon atoms, and

X is H, CH_3 or C_2H_5,

(D) 1–16 parts by weight per hundred parts of matrix resin (A) of a crystallization promotor derived from

(a) at least one source of carboxyl groups selected from the group consisting of hydrocarbon acids containing 7–54 carbon atoms and organic polymers having at least one carboxyl group attached thereto, and

(b) at least one source of metal ions capable of reacting with the carboxyl groups of (a) selected from the group consisting of sodium and potassium ion sources, where the concentration of said metal in said matrix resin (A) is at least 0.01 weight percent, and

(E) 0–80% by weight based on the total of components A, B, C, D and E of a material selected from the group consisting of reinforcing and filling materials.

4,548,979

FLAME-RESISTANT MOLDING COMPOSITIONS CONTAINING OXIDES OR HYDROXIDES OF RARE EARTH ELEMENTS

Carlos Weise, Burghausen, Fed. Rep. of Germany; Dietrich Wolfer, Unterecching, Austria, and Jörg Patzke, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 223,605, Jan. 9, 1981, Pat. No. 4,390,656.
This application Dec. 27, 1982, Ser. No. 453,649
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1980, 3002397
Int. Cl.[4] C08L *83/06*
U.S. Cl. 524—403 19 Claims

1. A flame-resistant molding composition consisting essentially of (1) a diorganopolysiloxane which is free of hydrogen and contains at least 90 percent by weight of diorganopolysiloxane units, (2) an organic polymer selected from the group consisting of polymers of ethylene, propylene, isobutylene, methylbutene-1, butene-1, methylpentene-1, isoprene, butadiene, styrene, hexadiene, dicyclopentadiene, ethylidene norbornene, vinyl chloride, vinylidene chloride, chloroprene, acrylic acid, methacrylic acid, acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, methyl acrylate, methyl methacrylate, ethyl methacrylate, vinyl acetate, vinyl laurate, vinyl alcohols, saponification products of copolymers of ethylene and vinyl acetate, polyvinyl acetals, chlorosulfonated polyethylenes, polyamides, polyimides, polycarbonates, polyurethanes, polyacetals, polyethers, polysulfones, polyesters, polyepichlorohydrins, polycarbodiimides and graft or block copolymers of diorganopolysiloxanes obtained from the polymerization of a diorganopolysiloxane and at least one organic compound having at least one aliphatic carbon-carbon double bond and (3) oxides or hydroxides of the rare earth elements.

4,548,980

TIRE TREAD RUBBER COMPOSITION

Takayoshi Nagata, Hyogo, and Mitsuaki Hashiyama, Shiga, both of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 632,830
Claims priority, application Japan, Jul. 22, 1983, 58-134656
Int. Cl.[4] C08K *3/04*; C08L *7/00, 9/00, 9/06*
U.S. Cl. 524—495 6 Claims

1. A rubber composition, comprising: from 20 to 150 parts by weight of carbon black incorporated in 100 parts by weight of diene rubber, said carbon black being a furnace carbon black having (1) a specific surface area (N_2SA) within the range of 75 to 105 (M 2/9) as measured by the nitrogen adsorption technique, (2) the difference between said N_2SA value and the measured iodine adsorption (IA) being at least 15, as represented by the formula $N_2SA-IA \geqq 15$, and (3) the difference between said N_2SA value and the measured surface by the cetytrimethylammonium bromide technique (CTAB) being not greater than 5, as represented by the formula $N_2SA-CTAB \leqq 5$, said furnace carbon black further having a dibutyl phthalate adsorption value (24M4 DBP) of not greater than 110 (ml/100 g), a Δ Tint value of not more than −3 which is obtained by subtracting the calculated tint value from the measured tint value, as represented by the formula: (Measured Tint)—(Calculated Tint)=ΔTint ≦ −3 and a tinting strength (Tint) of 90 to 110, said carbon black having a storage elastic modulus E' of not greater than 12.5 MPa as specified by the recipe of the ASTM-D 3191 method for carbon blacks.

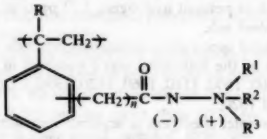
4,548,981

COMPOSITIONS AND ARTICLES CONTAINING POLYMERIC VINYL AROMATIC AMINIMIDES

Henry S. Kolesinski, Burlington, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 1, 1983, Ser. No. 510,274
Int. Cl.[4] C08L *57/12*
U.S. Cl. 524—555 11 Claims

1. An aqueous polymeric composition exhibiting thermoreversible gel forming properties comprising an aqueous medium having therein, at a weight concentration of from 4% to 10%, a polymeric vinyl aromatic aminimide comprising repeating units of the formula



wherein R is hydrogen, methyl or halogen; n is zero or one; and each of R^1, R^2 and R^3 is alkyl, aryl, aralkyl or alkaryl, or two of R^1, R^2 and R^3, together with the nitrogen atom to which they are bonded, complete a heterocyclic ring.

4,548,982

DRILLING FLUIDS

Earl Clark, Jr., and Howard B. Irvin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 2, 1983, Ser. No. 528,922
Int. Cl.[4] C08L *33/02*
U.S. Cl. 524—556 29 Claims

1. A method of preparing a composition suitable for use as a drilling fluid additive or the like, comprising:

copolymerizing at least one hydrophilic vinyl monomer selected from the group consisting of acrylic acid, methacrylic acid and combinations thereof with at least one hydrophobic vinyl monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters, vinyl esters of saturated monocarboxylic acids having from 1 to 3 carbon atoms, and combinations of any two or more thereof under anhydrous polymerization conditions in a liquid medium to produce a copolymer; and

contacting said resulting copolymer in said liquid medium with anhydrous ammonia to produce the salt form of said resulting copolymer.

4,548,983

METHOD OF MANUFACTURING SHAPED ARTICLE OF HYDROGEL

Mitsuru Yokota; Shuji Fujioka; Tsutomu Goshima; Hideki Kenjo, and Kazushige Komaki, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,261
Claims priority, application Japan, Jun. 24, 1983, 58-112694; Jun. 27, 1983, 58-114305
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—726 12 Claims

1. A method of manufacturing a shaped article of hydrogel by:

(I) forming a polymerizable mixture consisting essentially of:

(A) an alkylene glycol mono(meth)acrylate or a monomer mixture consisting primarily of an alkylene glycol mono(meth)acrylate,

(B) a preformed copolymer possessing a polymerizable double bond in the molecular structure thereof and formed by reacting: (a) a (co)polymer of an alkylene glycol mono(meth)acrylate or of a monomer mixture consisting primarily of an alkylene glycol mono(meth)acrylate, said (co)-

polymer possessing a hydroxyl group or a terminal carboxyl group, with (b) a monomer possessing a polymerizable double bond and a functional group which reacts with said hydroxyl group or carboxyl group,

(C) a water-soluble dipolar aprotic solvent, and

(D) at least one member selected from the group consisting of (a) water-soluble organic acids, (b) surface active agents, and (c) water-soluble organic substances which are poor solvents or non-solvents for the preformed copolymer (B);

the weight ratio of the component A to the preformed copolymer (B) in said polymerizable mixture being in the range of 45:55 to 20:80; and

(2) polymerizing the polymerizable mixture (1) in a mold.

4,548,984

INTERNALLY COLORED POLYOL (ALLYL CARBONATE) POLYMERIZATES COMPRISING INORGANIC MOLYBDENUM COMPOUNDS

Michael S. Misura, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1984, Ser. No. 687,217

Int. Cl.⁴ C08K *3/10*

U.S. Cl. 524—780 **26 Claims**

1. A solution comprising:

(a) liquid allylic-functional material comprising polyol(allyl carbonate)monomer, liquid polyol(allyl carbonate)-polymer, or a mixture thereof,

(b) molybdenum dioxydichloride, and

(c) molybdenum hexacarbonyl.

4,548,985

HOT-MELT ADHESIVE

Jinichi Yazaki, Tokyo; Kozaburo Sakano, Kawasaki, and Junichi Matsuo, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 507,915

Claims priority, application Japan, Feb. 15, 1983, 58-21989

Int. Cl.⁴ C08L *51/06, 63/00*

U.S. Cl. 525—65 **8 Claims**

1. A hot-melt adhesive composition comprising

(A)(i) an acid-modified olefin resin formed by graft modification with an ethylenically unsaturated carboxylic acid or its anhydride or (ii) a resin mixture of said acid-modified olefin resin with an olefin resin and

(B) an oxirane ring-containing compound selected from the group consisting of epoxidized glycerides, epoxidized fatty acid esters and epoxy hexahydrophthalic acid esters, said composition having a carbonyl group concentration of 1 to 600 millimoles per 100 g of the composition and an oxirane oxygen concentration of 0.01 to 50 millimoles per 100 g of the composition.

4,548,986

UNDERCOATING COMPOSITION

Takeshi Suzuki, Nagaokakyo, and Seisuke Suzue, Ibaraki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Filed Apr. 23, 1984, Ser. No. 602,674

Claims priority, application Japan, Apr. 27, 1983, 58-75264

Int. Cl.⁴ C08L *51/00, 77/00*

U.S. Cl. 525—66 **5 Claims**

1. An undercoating composition for a fluorocarbon polymer coating comprising:

(a) about 5 to 25 parts by weight per part by weight of the tetrafluroethylene copolymer (b) of a modified tetrafluoroethylene polymer in the form of particles of double-layer structure having a core and a shell wherein the core occupies about 70% of the whole weight of the particle, the core comprising a tetrafluoroethylene homopolymer or a copolymer of tetrafluoroethylene with a fluorine-containing α-olefin represented by the formula

$$CF_2{=}CFR$$

wherein R is a member selected from the group consisting of chlorine, and perfluoroalkyl, polyfluoroalkyl, perfluoroalkyloxy and polyfluoroalkyloxy each having 1 to 10 carbon atoms, and the alkyl or alkyloxy groups may have one or more oxygen atom in their chain, the shell comprising a copolymer of tetrafluoroethylene and said fluorine-containing α- olefin copolymerized therewith in a larger amount than in the core,

(b) a copolymer of tetrafluoroethylene and said fluorine-containing α-olefin which can be the same or different as in the case of (a) uniformly copolymerized therewith, and

(c) about 0.1 to 20 parts by weight per part by weight of the combined amount of the modified tetrafluoroethylene polymer (a) and tetrafluoroethylene copolymer (b) of an auxiliary adhesive agent selected from the group consisting of polyimide, polybismaleimide, polyamideimide and aromatic polyamide.

4,548,987

ABS-POLYCARBONATE MIXTURES WHICH HAVE IMPROVED FLAME RESISTANCE

Wolfgang Bauer, Krefeld; Christian Lindner, Cologne; Friedemann Müller, Neuss; Hans-Jürgen Kress, Krefeld; Karl Zabrocki, Buettgen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,453

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333721

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—67 **6 Claims**

1. An ABS-polycarbonate mixture comprising

(A) from 10–90% by weight of an aromatic polycarbonate,

(B) from 10–50% by weight of a graft polymer which is from 5 to 90% by weight of a mixture of

(a) from 50–90% by weight of styrene, α-methylstyrene, nuclear-substituted styrene or methyl methacrylate or mixture thereof,

(b) from 10–50% by weight of (meth)-acrylonitrile and

(c) from 0–20% by weight of at least one further copolymerisable compound, on from 95–10% by weight of a rubber having a glass temperature T_G of ≦0° C.,

(C) from 80–0% by weight of copolymerized monomers

(a) from 50–90% by weight of styrene, α-methylstyrene nuclear-substituted styrene or methyl methacrylate or mixture thereof,

(b) from 90–50% by weight of (meth)acrylonitrile and

(c) from 0.2–20% by weight of a further copolymerisable compound, the percentages by weight of A, B and C being based on the sum of A, B and C and the further co-polymerisable compounds (Bc) and (Cc) corresponding to one of the formulae

$$CH_3{-}CO{-}CH_2{-}CO{-}OR_1{-}OOC{-}\overset{\displaystyle R_2}{\overset{|}{C}}{=}CH_2 \text{ or}$$

$$CH_3{-}CO{-}CH_2{-}CO{-}OR_3{-}\overset{\displaystyle R_4}{\overset{|}{C}}{=}CH_2$$

wherein

R_1 represents C_2–C_6 alkylene,

R_2 represents hydrogen or methyl,

R_3 represents a direct bond or C_1–C_4 alkylene and

R_4 represents hydrogen, methyl or $CH_2{-}OOC{-}CH_2{-}CO{-}CH_3$ and the total quantity of (Bc) and (Cc) being from 0.2 to 25% by weight, based on PC-ABS.

4,548,988

POLYMERIC MATERIAL CONSISTING OF A MIXTURE OF HIGH-IMPACT POLYSTYRENE, HIGH-DENSITY POLYETHYLENE AND A STYRENE/DIENE BLOCK COPOLYMER

Jean Castelein, Mellery, Belgium, assignor to Montefina S.A., Feluy, Belgium

Continuation of Ser. No. 356,662, Mar. 10, 1982, abandoned. This application Aug. 31, 1983, Ser. No. 528,168
Claims priority, application Italy, Mar. 12, 1981, 20314 A/81
Int. Cl.[4] C08L 53/02
U.S. Cl. 525—71 2 Claims

1. Thermoplastic material having high-impact resistance even at a low temperature, consisting of a homogeneous mixture of, by weight based on the total weight,

40% to 50%, inclusive, of high density polyethylene;

50% to 40%, inclusive, of high-impact polystyrene, and

about 10% inclusive, of a styrene/diene block copolymer, with three or more sequences, of the $S-(D-S)_n$ structure wherein n is a whole number or integer, S is a polystyrene block, D is an isoprenic block or hydrogenated butadienic block, with a content in styrene lower than 50% by weight.

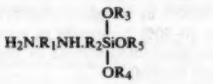
4,548,989

FLUOROCARBON POLYMER COMPOSITIONS

Christopher M. Allen, Mountsorrel, and Ian R. Hinchliff, Leicester, both of England, assignors to USM Corporation, Farmington, Conn.

PCT No. PCT/GB81/00248, § 371 Date Jul. 20, 1982, § 102(e) Date Jul. 20, 1982, PCT Pub. No. WO82/01713, PCT Pub. Date May 27, 1982
PCT Filed Nov. 19, 1981, Ser. No. 403,626
Claims priority, application United Kingdom, Nov. 21, 1980, 8037487
Int. Cl.[4] C08F 8/00; B05D 5/00
U.S. Cl. 525—101 5 Claims

1. A room temperature curable composition substantially free of thiol and comprising a fluorocarbon copolymer, a curing system comprising a metallic oxide and from about 2.5 to about 10 parts by weight per hundred parts by weight copolymer of an epoxy resin which is a liquid reaction product of bisphenol A and epichlorohydrin and having an epoxide equivalent of about 185 and 192 and, a crosslinking agent consisting essentially of a diamino silane corresponding to the formula below:



where

R_1 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms,

R_2 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms, and

R_3, R_4 and R_5 are the same or different monovalent aliphatic hydrocarbon residues having 1 to 5 carbon atoms.

4,548,990

CROSSLINKED, POROUS POLYMERS FOR CONTROLLED DRUG DELIVERY

Karl F. Mueller, New York, and Sonia J. Heiber, Bedford Hills, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,236
Int. Cl.[4] C08L 75/00; C08G 73/12; A61K 9/22
U.S. Cl. 525—123 15 Claims

1. A controlled-release, drug-delivery carrier composition which comprises

a crosslinked copolymer, capable of swelling in ethanol to give a swollen copolymer containing at least 40% by weight of ethanol, and capable of swelling in water to give a swollen copolymer containing no more than 20% by weight of water, where the % ethanol: % water is 2:1 to 22:1 respectively, which copolymer is the copolymerization product of

(a) 50 to 99% by weight of said copolymer of (aa) a water-insoluble monoolefinic monomer, or mixture of said monomers, or mixture of said monomers with 0 to 45% by weight of total monomers of (bb) a water-soluble monolefinic monomer, or mixture of said water-soluble monomers, with

(b) 50 to 1% by weight of said copolymer of a divinyl or polyvinyl crosslinking agent having a molecular weight of 100 to 10,000, but where (b) is not more than 20 mol% of component (a).

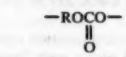
4,548,991

BLENDS OF POLYCARBONATE OR POLYESTERCARBONATE WITH 4-METHYL-1-PENTENE POLYMERS

Darrell C. Feay, Orinda, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1983, Ser. No. 493,081
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—146 4 Claims

1. A normally-solid blend of at least one aromatic carbonate polymer with a polyolefin comprising about 2 to about 12 percent by weight of an addition polymer of 4-methyl-1-pentene per hundred parts of aromatic carbonate polymer, said addition polymer being prepared by the homopolymerization of 4-methyl-1-pentene or by copolymerization of 4-methyl-1-pentene with up to about 15 mole percent of other olefin monomers and said aromatic carbonate polymer has a weight average molecular weight of at least 25,000 and consists of a plurality of repeating units corresponding to the formula



wherein each R is independently aromatic hydrocarbylene or inertly substituted aromatic hydrocarbylene, with the proviso that the resulting blend exhibits an Izod impact strength of at least about 5.0 foot-pounds per inch notch when tested in accordance with ASTM D-256 following immersion in 100° C. water for 1000 hours.

4,548,992

TWO-PART TYPE ADHESIVES

Hidemi Doi; Takanori Okamoto, and Hideaki Matsuda, all of Kagawa, Japan, assignors to Okura Koygo Kabushiki Kisha, Japan

Continuation of Ser. No. 423,449, Sep. 24, 1982, abandoned. This application Jul. 18, 1984, Ser. No. 632,212
Claims priority, application Japan, Dec. 5, 1981, 56-195123
Int. Cl.[4] C08L 9/02, 67/06
U.S. Cl. 525—167 10 Claims

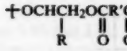
1. A two-part type adhesive composed of liquid I comprising components (a), (b) and (c) set forth below and liquid II comprising components (a), (c) and (d) set forth below,

(a) acrylic monomer 40 to 90%

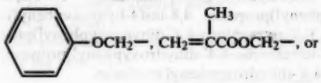
(b) organic peroxide 0.5 to 20%

(c) nitrile rubber 2 to 50%

(d) curing accelerator 0.05 to 10%, liquid I or both liquids I and II further containing 0.2 to 30% of an ion-containing unsaturated polyester represented by the general formula



wherein R represents hydrogen, alkyl of 1 or 2 carbon atoms,



$CH_2{=}CHCH_2OCH_2{-}$;

R′ represents a dibasic acid residue; and n is an integer of 4 to 20; at least one of said R and R′ having a polymerizable or copolymerizable double bond, and the remaining carboxy group of said polyester being neutralized by an alkali metal, ammonia or an amine or mixtures thereof; the percentages set forth above all being by weight based on the weight of liquids I and II.

4,548,993

METHOD FOR IMPROVING THE CHARACTERISTICS OF POLYOLEFINS UNDER HEATING

Enea Garagnani, Ferrara; Alessandro Moro, Occhiobello, and Roberto Marzola, Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 9, 1983, Ser. No. 465,106
Claims priority, application Italy, Feb. 10, 1982, 19551 A/82
Int. Cl.⁴ C08F *255/02*
U.S. Cl. 525—195 **8 Claims**

1. Process for the cross-linking of polymers and copolymers of alpha-olefins to improve the mechanical resistance characteristics thereof under heating, said process consisting in grafting a carboxylic acid, onto the polymeric chain by mechanical mixing of the polymeric product with the acid, at a temperature of at least 170° C., and in the subsequent salification of the free carboxylic groups with metal compounds of a basic character, said carboxylic acid being introduced in a quantity equal to from 0.01% to 10% by weight on the weight of the starting polymeric product.

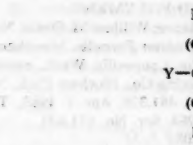
4,548,994

ISOLATION OF BACTERIAL LUCIFERASE

Thomas O. Baldwin, and Thomas F. Holzman, both of Bryan, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

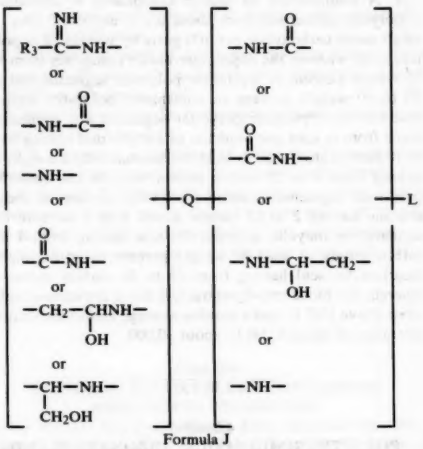
Division of Ser. No. 326,244, Dec. 3, 1981, Pat. No. 4,412,001, which is a continuation-in-part of Ser. No. 230,178, Jan. 30, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,245
Int. Cl.⁴ C08F *8/30*
U.S. Cl. 525—329.9 **12 Claims**

1. An affinity resin as described in the following Formulas J and K which comprises a support material, a spacer arm, and a ligand wherein

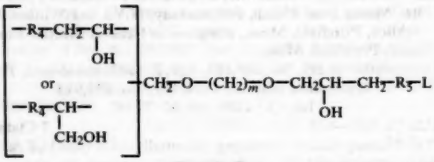


wherein Y is a bond or an alkylene chain of 1 to 4 carbon atoms, one or 2 carbon atoms of which may be branched; Z is hydrogen or a straight or branched alkyl group having from 1 to 4 carbon atoms; q is zero or one; p is zero, one or 2; R_1 is hydrogen, phenyl or phenyl substituted with one or 2 substituents selected from halogen, trihalomethyl, a straight or branched alkoxy group having from 1 to 4 carbon atoms or a straight or branched alkyl group having from 1 to 4 carbon atoms; and R_2 is ortho, meta or para-biphenylyl, phenyl, or phenyl substituted with one or 2 substituents selected from halogen, trihalomethyl, a straight or branched alkoxy group having from 1 to 4 carbon atoms or a straight or branched alkyl group having from 1 to 4 carbon atoms with the provisos that: (a) when R_2 is biphenylyl, each of p and q is zero and R_1 is hydrogen; (b) when p is 2, q is zero; and (c) when R_2 is other than biphenylyl, R_1 is other than hydrogen, or when the functional linkage in the right hand bracket is other than

L is 2-(2,4-dichloro-6-phenylphenoxy)ethanyl or 2-(2,3-dichloro-6-phenylphenoxy)ethanyl:



Formula J



Formula K

4,548,995

PROCESS FOR THE MANUFACTURE OF HALOGENATED POLYMERS

Ronald C. Kowalski, New Providence; William M. Davis; Neil F. Newman, both of Edison; Z. Andrew Foroulis, Mendham, all of N.J., and Francis P. Baldwin, Coupeville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 481,320, Apr. 1, 1983,. This application Sep. 17, 1984, Ser. No. 651,621

Int. Cl.[4] C08F *8/22*

U.S. Cl. 525—354 **82 Claims**

1. A process for the continuous production of halogenated polymer, the process comprising contacting a cohesive polymer mass and halogenating agent in a continuous flow device comprising means for conveying said polymer through said device wherein by-product of the halogenation reaction and unreacted halogenating agent are disengaged from said halogenated polymer mass in said continuous flow device downstream of said contact between said polymer and said halogenating agent by means comprising deforming and disrupting said halogenated polymer, thereby continually generating new polymer surface and injecting an effective amount of inert gas thereby neutralizing said halogenated polymer by disengaging halogenation reaction by-products and unreacted halogenating agent.

4,548,996

HOT MELT ADHESIVE COMPOSITIONS

Donald D. Donermeyer, Springfield, Mass.; Joseph G. Martins, deceased, late of Ludlow, Mass. (by Alice J. Martins, executrix), and by Joseph C. Martins, executor, Woburn, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 9, 1984, Ser. No. 569,016

Int. Cl.[4] C08G *69/49;* **C08F** *283/04*

U.S. Cl. 525—420.5 **12 Claims**

1. A composition of matter comprising a crystallizable copolyesteramide and from about 0.1 to about 6.0 meq of an alkali metal carboxylate per 100 parts by weight of copolyesteramide, wherein the copolyesteramide comprises from 40 to 80 weight percent of crystalline polyester segments and from 20 to 60 weight percent of amorphous polyester segments, wherein the crystalline polyester segments are condenstates made from at least one aliphatic or alicylic diol having from 2 to 10 carbon atoms and at least one aromatic dicarboxylic acid having from 8 to 20 carbon atoms, wherein the amorphous polyamide segments are condensates of an aliphatic or alicyclic diamine having 2 to 12 carbon atoms with a mixture of an aliphatic or alicyclic dicarboxylic acid having from 4 to 54 carbon atoms, at least 40 weight percent being an aliphatic dicarboxylic acid having from 18 to 54 carbon atoms, and wherein the block copolyesteramide has a crystalline melting point above 100° C. and a number average molecular weight in the range of about 8,000 to about 30,000.

4,548,997

POLYETHERIMIDE-POLYCARBONATE BLENDS

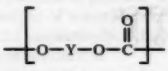
Gary A. Mellinger, Louisville, Ky.; Harold F. Giles, Jr., Cheshire, Mass.; Fred Holub, Schenectady, N.Y., and William R. Schlich, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 365,584, Apr. 5, 1982, abandoned. This application May 22, 1984, Ser. No. 612,913

Int. Cl.[4] C08L *69/00, 79/08*

U.S. Cl. 525—433 **7 Claims**

1. A composition consisting essentially of a blend of (a) a polycarbonate and (b) a polyetherimide, wherein the polycarbonate consists of recurring structural units of the formula:



wherein Y is divalent aromatic radical of a dihydric phenol selected from the group consisting of 2,2-bis(4-hydroxyphenyl)propane, bis(4-hydroxyphenyl)methane, 2,2-bis(4-hydroxy-3-methylphenyl)propane, 4,4-bis(4-hydroxyphenyl)-heptane, 2,2-(3,5,3',5'-tetrachloro-4,4'-dihydroxyphenyl)propane, 2,2-(3,5,3',5'-tetrabromo-4,4'-dihydroxyphenyl)propane, and (3,3'-dichloro-4,4'-dihydroxyphenyl)methane.

4,548,998

THERMOSETTING HIGH SOLIDS SOLVENT-BASED POLYESTER-URETHANE COATING COMPOSITION AND A METHOD OF PREPARING SAME

Wen-Hsuan Chang, Gibsonia, and Ronald R. Ambrose, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 7, 1984, Ser. No. 679,187

Int. Cl.[4] C08F *283/00;* **C08G** *63/76*

U.S. Cl. 525—441 **20 Claims**

1. An improved high solids, solvent-based, thermosetting coating composition having a sprayability of at least 40 percent, which when cured is flexible and hard in that when the coating composition is deposited on an elastomeric substrate and cured, the coated substrate can be bent around a ½-inch mandrel with the coating facing outwardly and the coating exhibits substantially no breaks or cracks when tested at 35° F.; and in that when the coating composition is deposited on a metallic substrate and cured, the coated substrate has a Sward hardness of at least 14; said coating composition contains a film-former comprising a polyester-urethane polyol and a curing agent; the polyester-urethane polyol has a hydroxyl value of at least 50 and comprises:

(A) about 60 to 95 percent by weight acyclic moieties, and optionally

(B) up to about 30 percent by weight cyclic moieties;

the sum of the weight percentage of cyclic moieties and the weight percentage of urethane moieties multiplied by 3 is from about 15 to 65; the improvement comprising preparing the polyurethane polyol by reacting urea, polyamine and a polyester polyol.

4,548,999

ELASTOMERIC ORGANOPOLYSILOXANES CONTAINING POLYCARBODIIMIDE-POLYSILOXANE COPOLYMERS

Helmut Steinberger, Leverkusen; Hans-Heinrich Moretto; Werner Michel, both of Cologne, and Wilfried Kniege, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 85,840, Oct. 18, 1979, abandoned, and a continuation-in-part of Ser. No. 86,113, Oct. 18, 1979, abandoned. This application Feb. 5, 1981, Ser. No. 231,693

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847481; Nov. 2, 1978, 2847573

Int. Cl.[4] C08L *83/06*

U.S. Cl. 525—453 **9 Claims**

1. A composition which is heat curable to give an elastomer of improved properties comprising

(a) an organopolysiloxane polymer having a viscosity of 1,000,000 to 200,000,000 mPas at 25° C. and comprising the structural unit

wherein

R is a hydrocarbon radical or a halohydrocarbon radical, and

a is between about 1.95 and 2.01,

(b) a polycarbodiimide-polysiloxane copolymer comprising a polysiloxane continuous liquid phase containing a discontinuous phase of finely dispersed polycarbodiimide particles produced by condensing a diisocyanate in the polysiloxane,

(c) a curing catalyst, and

(d) a filler,

the polycarbodiimide comprising about 0.1 to 80% by weight of (a) plus (b).

4,549,000

THERMOSETTING POWDER LACQUER FOR COVERING WELD SEAMS

Hans R. Widmer, Hombrechtikon, and Christian Schmid, Meilen, both of Switzerland, assignors to Vernicolor AG, Grüningen, Switzerland

Filed Mar. 5, 1984, Ser. No. 586,330

Claims priority, application Switzerland, Mar. 9, 1983, 1264/83

Int. Cl.⁴ C08G *59/38*

U.S. Cl. 525—482 **17 Claims**

1. A thermosetting powder lacquer on an epoxide resin basis essentially consisting of:

a mixture of polymeric aromatic epoxide resins comprising at least two components a first of which contains a maximum of two epoxide groups per molecule on the average and a second of which contains more than two epoxide groups per molecule on the average;

a hardener selected from the group consisting of: (i) condensation product of diglycidylether of bisphenol-A and bisphenol-A; (ii) polyester made of trimellitic acid anhydride and aliphatic polyol and containing free carboxylic acid groups; (iii) phenolic resin; or (iv) a mixture thereof; and

a catalyst.

4,549,001

OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1984, Ser. No. 654,923

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 526—125 **17 Claims**

1. A process for the polymerization of olefins which comprises contacting at least one mono-1-olefin under polymerization conditions with a catalyst composition obtained by bringing together a catalyst component A formed by admixing (1) at least partially fluorinated magnesium alkoxide with (2) halogenated tetravalent titanium compound and a cocatalyst component B comprising at least one organoaluminum compound.

4,549,002

EMULSIFIERS FOR EMULSION POLYMERIZATION

Rainer Hoefer, Duesseldorf; Alfred Meffert, Monheim, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed May 30, 1984, Ser. No. 615,444

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319782

Int. Cl.⁴ C08P *2/30*

U.S. Cl. 526—209 **22 Claims**

1. In a process for the emulsion polymerization of at least one ethylenically unsaturated monomer in an aqueous emulsion with at least one emulsifier, the improvement wherein:

(A) the primary emulsifier is at least one compound which is the product of 1 mol of a C_{8-25} aliphatic vicinal diol ethoxylated with about 5–200 mols of ethylene oxide, and said primary emulsifier is used in a quantity of about 0.1 to 5% by weight, based on the entire weight of said emulsion;

(B) said ethylenically unsaturated monomer is

(a) predominantly n-butyl acrylate,

(b) predominantly approximately equal amounts by weight of styrene and n-butyl acrylate,

(c) predominantly vinyl acetate, or

(d) predominantly about 2 parts by weight of vinyl acetate and about 1 part by weight of versatic acid-vinyl ester; and

(C) the proportion of the total amount of monomers to water is about 1–3:1, in parts by weight.

4,549,003

METHOD FOR PREPARING NOVEL FLUORINATED ORGANOSILOXANE COPOLYMERS

Thomas F. Lim, Midland, and Antony P. Wright, Rhodes, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 664,917

Int. Cl.⁴ C08G *77/24*

U.S. Cl. 528—42 **7 Claims**

1. A method for preparing a fluorine-containing organosiloxane copolymer consisting essentially of repeating units of the formula $R'CH_2CH_2Si(R'')_nO_{(3-n)/2}$, $R(CH_3)_2SiO_{\frac{1}{2}}$, $SiO_{4/2}$, silicon-bonded hydroxyl groups, and optionally, $(CH_3)_2SiO$ units, said method comprising the steps of

I. heating to a temperature of from 50° C. to the boiling point thereof of a liquid reaction mixture comprising

(A) a fluorinated silane of the formula

$$R'CH_2CH_2Si(R'')_nX_{3-n},$$

(B) a nonfluorinated benzene soluble organosiloxane copolymer consisting essentially of repeating units of the formula $R(CH_3)_2SiO_{\frac{1}{2}}$ and $SiO_{4/2}$ in a molar ratio of from 0.6:1–1.1:1, respectively, at least 0.1% by weight of silicon-bonded hydroxyl groups, and, optionally, $(CH_3)_2SiO$ units,

II. continuing heating of said liquid reaction mixture for a period sufficient to form said fluorine-containing organosiloxane copolymer, and

III. removing any acidic byproducts generated during the reaction of (A) and (B),

where R represents a saturated or ethylenically unsaturated hydrocarbon radical containing from 1 to 4 carbon atoms or a phenyl radical, R' represents a monovalent organic radical containing at least 4 perfluorinated carbon atoms, R'' represents an alkyl radical containing from 1 to 3 carbon atoms or a phenyl radical, X represents a hydrolyzable group and n is 0, 1 or 2.

4,549,004

FLUOROALKYLOXYALKYL CONTAINING ORGANOPOLYSILOXANES

Günter von Au, Sao Paulo, Brazil; Ernst Innertsberger, Burghausen, Fed. Rep. of Germany; Jakob Schmidlkofer, Mehring-Öd, Fed. Rep. of Germany, and Wolfgang Kaiser, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

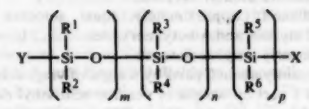
Division of Ser. No. 553,950, Nov. 21, 1983, Pat. No. 4,489,201. This application Oct. 2, 1984, Ser. No. 640,475

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248535

Int. Cl.⁴ C08G *77/24*

U.S. Cl. 528—42 **8 Claims**

1. A lubricant containing a diorganopolysiloxane of the formula



where R^1 represents fluoroalkyloxyalkyl groups of the formula

$$-(CH_2)_a-O-C_bF_{2b}H$$

in which the hydrogen atom is in the beta position relative to the ether oxygen: a is 2, 3 or 4; b is an integer of from 1 to 6; R^2 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having 2 or 3 carbon atoms, an aryl group having 6 to 8 carbon atoms and hydrogen; R^3 represents the group

$$-(CH_2)_c-C_dF_{(2d-e+1)}Hal_e$$

where Hal represents a terminal halogen group selected from the class consisting of chlorine, bromine and iodine; c is 2, 3 or 4; d is an integer having a value of from 1 to 18; e is 0 or 1; R^4, R^5 and R^6 are each selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having 2 or 3 carbon atoms, an aryl group having 6 to 8 carbon atoms and hydrogen; X and Y are each selected from the group consisting of condensable terminal groups and trialkylsiloxy groups in which the alkyl groups have from 1 to 6 carbon atoms; m has a value of from 0.05 to 0.9; n has a value of from 0 to 0.6; and p has a value of from 0.1 to 0.8; with the proviso that the sum of $m+n+p=1$.

4,549,005

CURED POLYMERIC MATERIAL PREPARED BY REACTING AN AZADIOXABICYCLOOCTANE WITH A POLYISOCYANATE IN THE PRESENCE OF MOISTURE

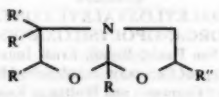
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 9, 1984, Ser. No. 658,969

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—53 **11 Claims**

1. The process for preparing a cured polymeric material comprising mixing a compound conforming to the formula



wherein R is a hydrocarbon group having from 1 to 18 carbon atoms and R′ can be independently selected and represents hydrogen, a hydrocarbon group having from 1 to 18 carbon atoms or an ether group having from 2 to 18 carbon atoms; and R″ represents hydrogen, a hydrocarbon group having from 1 to 18 carbon atoms and an ether group having from 2 to 18 carbon atoms, with a polyisocyanate compound having at least two isocyanate groups per molecule and allowing the resulting mixture to react in the presence of moisture.

4,549,006

POLYAMIDEIMIDES PRODUCED FROM EITHER LACTAMS OR POLYAMIDES WITH ISOCYANATES AND ANHYDRIDES AS THERMOPLASTS

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,515

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332031

Int. Cl.[4] C08G *73/14*

U.S. Cl. 528—73 **1 Claim**

1. A thermoplastic moulding composition containing a polyamide imide produced in a first stage by reacting polyisocyanates with polycarboxylic acid anhydrides and lactams or polyamides in a solvent and then in a second stage concentrated in an evaporation extruder at a temperature of from 250° to 400° C. and condensed out.

4,549,007

DIAMINE/DIOL CHAIN EXTENDER BLENDS FOR RIM PROCESS

I. Sioun Lin, Oak Ridge; Stanley J. Gromelski, Jr., West Caldwell, both of N.J.; Jesse Werner, New York, N.Y.; Michael J. Brown, Randolph Township, Morris County, N.J., and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 506,250, Jun. 23, 1983, Pat. No. 4,523,004, which is a continuation-in-part of Ser. No. 406,756, Aug. 9, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,211

Int. Cl.[4] C08G *18/32, 18/14;* B29H *7/20*

U.S. Cl. 528—76 **7 Claims**

1. In a process for the production of polyurethane-polyurea elastomer moldings from a reaction mixture by a reaction injection molding process, wherein said reaction mixture comprises the components:

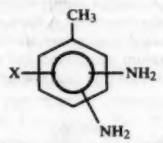
(a) an isocyanate reactant;

(b) a polyol reactant having molecular weight of from 400 to 12,000;

(c) a chain extender; and

(d) a catalyst;

the improvement wherein said chain extender is a normally liquid blend of butanediol and a mono-substituted toluene diamine having the formula



wherein X is vicinal to an amino radical and is an electron-withdrawing substituent selected from the group of halo, CN, NO_2, acyl and carboxylate and wherein the alkyl moieties of said acyl and carboxylate groups contain 1 to 6 carbon atoms, and isomeric mixtures of said mono-substituted toluene diamines, said blend formed of a mole ratio between about 4:1 and about 19:1 butanediol to said diamine and wherein said liquid blend is combined with said component (b) in a mole ratio of from about 1:0.01 and about 1:0.9 prior to contact with said component (a) and wherein components (a), (b), (c) and (d) are contacted for a period less than 1 minute in a high impingement mixing zone prior to pressurizing the contacted mixture into a mold maintained at polymerization temperature for a period of not more than 1 minute and recovering molded polyurethane-polyurea elastomer from said mold.

4,549,008

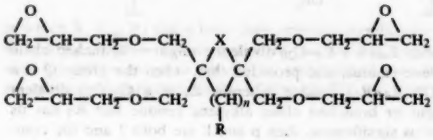
NOVEL TETRAGLYCIDYL ETHERS

Alfred Renner, Muntelier; Peter Grütter, Aarau, and Rolf Hügi, Ramlinsburg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 13, 1984, Ser. No. 640,281
Claims priority, application Switzerland, Aug. 23, 1983, 4577/83; Apr. 18, 1984, 1947/84
Int. Cl.[4] C08G 59/24, 59/32
U.S. Cl. 528—220 9 Claims

1. A tetraglycidyl ether of the formula I

(I)



wherein X is a group

R is hydrogen or methyl, and n is an integer from 2 to 4.

9. A curable mixture containing a tetraglycidyl ether according to claim 1, and a curing agent for epoxide resins.

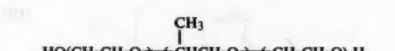
4,549,009

POLYMERIC GLYCOL ESTER

Yuzo Higaki, Tokyo, and Akitoshi Ukai, Yokohama, both of Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 57,507, Jul. 13, 1979, , which is a continuation of Ser. No. 821,306, Aug. 2, 1977, abandoned. This application May 21, 1984, Ser. No. 612,750
Claims priority, application Japan, Aug. 10, 1976, 51-94454
Int. Cl.[4] C08G 63/66
U.S. Cl. 528—301 7 Claims

1. A polymeric ester obtained by reacting (A) at least one polymeric glycol represented by the general formula



where the sum of x and y has an average value of from 1 to 50, y has an average value of from 10 to 60, and the total content of ethylene glycol units in all molecules is from 5 to 50% by weight, with (B) at least one carboxylic acid selected from the group consisting of saturated aliphatic dicarboxylic acids and saturated aliphatic hydroxydicarboxylic acids.

4,549,010

BIOERODIBLE POLY(ORTHO ESTER) THERMOPLASTIC ELASTOMER FROM DIKETENE DIACETAL

Randall V. Sparer, and Stefano A. Pogany, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 27, 1984, Ser. No. 625,166
Int. Cl.[4] C08G 65/28
U.S. Cl. 528—361 4 Claims

1. A bioerodible poly(ortho ester) thermoplastic elastomer prepared from:

(A) a diketene diacetal;

(B) a long-chain non-polar, flexible diol containing 4 to 22 carbon atoms and

(C) a diol containing at least one functional group which results in hydrogen bonding or other association selected from the group consisting of amide, urethane, urea and imide groups.

4,549,011

MODIFIED SHEET OF MATERIAL AND METHOD OF MAKING AND USING SAME IN CONNECTION WITH BIOCHEMICAL PROCEDURES

Max Herzberg, Moshav Sataria, and Falk Fish, Tel Aviv, both of Israel, assignors to Orgenics Ltd., Yavne, Israel

Filed Sep. 19, 1983, Ser. No. 533,770
Int. Cl.[4] C08L 1/02; A61F 13/00
U.S. Cl. 536—31 40 Claims

1. A sheet of material modified by cyanuric chloride.

4,549,012

FLUORINATED CELLULOSE ACETATE POLYMERS

Ashok K. Sharma, 1760 Lake St., St. Paul, Minn. 55113

Filed Aug. 13, 1984, Ser. No. 639,901
Int. Cl.[4] C08B 3/06, 3/22
U.S. Cl. 536—82 5 Claims

1. A modified cellulose acetate polymer, which comprises, a cellulose acetate polymer in which substantially all residual hydroxyl groups have been acylated to form perfluoroacyl ester groups having the general form $—OCO(CF_2)_NCF_3$, wherein N is a number from 2 to 10, and wherein the fluorine content of the polymer is at least about 15 percent by weight.

4,549,013

CHLORO-SUBSTITUTED SUCROSE COMPOUNDS

Leslie Hough; Shashikant P. Phadnis, both of London; Riaz A. Khan, Sonning, and Michael R. Jenner, Pangbourne, all of England, assignors to Chemical Bank, New York, N.Y.

Division of Ser. No. 755,661, Dec. 30, 1976, Pat. No. 4,435,440. This application Dec. 20, 1983, Ser. No. 563,661
Claims priority, application United Kingdom, Jan. 8, 1976, 616/76; May 12, 1976, 19570/76
Int. Cl.[4] C07H 15/24
U.S. Cl. 536—122 5 Claims

2. 4-chloro-4-deoxy-α-D-galactopyranosyl-1-chloro-1-deoxy-β-D-fructofuranoside.

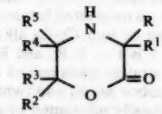
4,549,014

ADAMANTYL CONTAINING 1,4-OXAZINONE DERIVATIVES

Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 6, 1984, Ser. No. 647,787
Int. Cl.[4] C07D 265/34
U.S. Cl. 544—71 6 Claims

1. A 1,4-oxazinone derivative of the formula



wherein one of R and R^1 is hydrogen and the other represents the group $—CH_2CO_2R^6$ or together R and R^1 represent the group $=CHCO_2R^6$ where R^6 is alkyl, R^2 and R^3 together represent a single adamantyl group, and R^4 and R^5 are hydrogen, alkyl, substituted alkyl, phenyl, substituted phenyl, or benzyl.

4,549,015

HYDROQUINONE ETHER COMPOUNDS

Frederick H. Howell, Atherton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

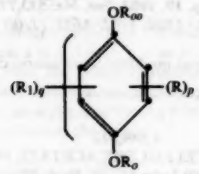
Filed Jun. 14, 1983, Ser. No. 504,283

Claims priority, application United Kingdom, Jun. 16, 1982, 8217445; Dec. 15, 1982, 8235665

Int. Cl.[4] C07C *65/03, 69/708, 103/76*

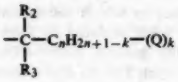
U.S. Cl. 544—87 10 Claims

1. A compound having the formula I



(I)

wherein p is 1 or 2 and q is 0 or 1, provided that p+q is 1 or 2; R is a residue of formula II

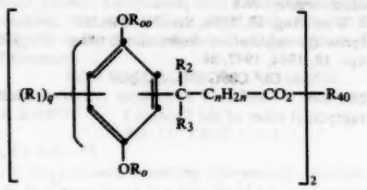


(II)

wherein Q is —COZR$_4$ wherein Z is —O— or

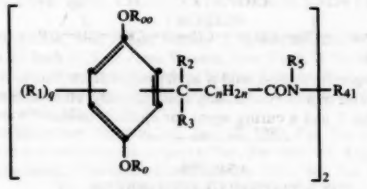
and R$_4$ independently is (1) —H, (2) a C$_1$–C$_{20}$ straight or branched chain alkyl optionally interrupted by 1 to 5 oxygen atoms and optionally substituted by a group —OR$_6$ wherein R$_6$ is C$_3$–C$_{12}$ cycloalkyl, straight or branched C$_3$–C$_{20}$ alkenyl, C$_6$–C$_{10}$ aryl optionally substituted by one or two C$_1$–C$_4$ alkyl groups or C$_7$–C$_{13}$ aralkyl, (3) a C$_2$–C$_{20}$ divalent straight or branched chain alkylene residue, (4) a C$_3$–C$_{20}$ straight or branched chain alkenyl group, (5) a C$_3$–C$_{12}$ cycloalkyl group, (6) a C$_6$–C$_{10}$ aryl group optionally substituted by one or two C$_1$–C$_8$ alkyl groups, (7) a C$_7$–C$_{13}$ aralkyl group, (8) a 5 or 6 membered heterocycle containing an oxygen atom, and optionally substituted by one or two C$_1$–C$_4$ straight or branched chain alkyl groups, or (9) methyl substituted by a 5 or 6 membered heterocycle containing an oxygen atom and optionally substituted by one or two C$_1$–C$_4$ straight or branched chain alkyl groups; and when Z is

R$_5$ is (1) hydrogen, (2) a straight or branched chain C$_1$–C$_{20}$ alkyl group or (3) a C$_5$–C$_6$ cycloalkyl group, or R$_4$ and R$_5$ together with the nitrogen atom to which they are each bonded may form a 5 or 6 membered heterocyclic ring, optionally substituted by one or two C$_1$–C$_4$ alkyl groups; n is an integer from 1 to 20; k is 1 or 2; R$_2$ and R$_3$ are the same or different and each is straight or branched chain alkyl group having from 1 to 5 carbon atoms and, when Q is —CO$_2$R$_4$, either R$_2$ or R$_3$ is optionally substituted by a —CO$_2$R$_4$ group, the R$_4$ groups being independent, or when Q is —COOR$_4$, R$_2$ or R$_3$ may be so linked to the residue C$_n$H$_{2n}$—COOR$_4$ that there is formed a C$_5$–C$_{12}$ cycloalkylene residue optionally substituted by another group —CO$_2$R$_4$ the R$_4$ groups being independent, wherein R$_4$ has its previous significance; provided that, when the group Q is a —CO$_2$R$_4$ residue wherein R$_4$ is a C$_2$–C$_{20}$ divalent straight or branched chain alkylene residue then p and k are both 1 and the compound of formula I has the formula Ia:



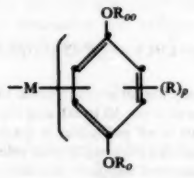
(Ia)

wherein R$_{40}$ is a C$_2$–C$_{20}$ divalent straight or branched chain alkylene residue; and provided that, when the group Q is a —CON(R$_4$)(R$_5$) residue wherein R$_4$ is a C$_2$–C$_{20}$ divalent straight or branched chain alkylene residue and R$_5$ has its previous significance, then p and k are both 1 and the compound of formula I has the formula Ib:



(Ib)

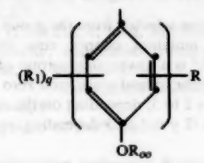
wherein R$_2$, R$_3$, q and n have their previous significance and R$_{41}$ is a C$_2$–C$_{20}$ divalent straight or branched chain alkyl residue; R$_1$ is C$_1$–C$_8$ straight or branched chain alkyl, C$_5$–C$_7$ cycloalkyl optionally substituted by one or two methyl or ethyl groups, C$_7$–C$_9$ aralkyl or a residue of formula II as hereinbefore defined, and when R$_1$ is a residue of formula II then R$_1$ and R may be the same or different; or R$_1$ is a residue of formula III:



(III)

in which R and p have their previous significance; and M is (1) a direct bond, (2) —C(R$_{13}$)(R$_{14}$)— in which R$_{13}$ and R$_{14}$ are the same or different and are hydrogen, C$_1$–C$_{20}$ straight or branched chain alkyl optionally interrupted by 1 to 3 sulphur atoms, C$_6$–C$_{10}$ aryl or R$_{13}$ and R$_{14}$, together with the carbon atom to which they are attached may form a 5- or 6-membered ring which may be further substituted by one or two C$_1$–C$_8$ straight or branched chain alkyl groups, (3) —S—, (4) —S—S—, (5) —SO$_2$—, (6) —CH$_2$SCH$_2$—, (7) —CH$_2$OCH$_2$—, or (8) —C(CH$_3$)$_2$-p-phenylen-C(CH$_3$)$_2$—; R$_o$ and R$_{oo}$ are the same or different and each is hydrogen, a C$_1$–C$_{20}$ straight or branched chain alkyl group optionally interrupted by 1 to 5 oxygen atoms, a C$_3$–C$_{12}$ cycloalkyl group, a C$_6$–C$_{10}$ aryl group optionally substituted by one or two C$_1$–C$_4$ straight or branched chain alkyl groups, or a C$_7$–C$_{13}$ aralkyl group provided that both of R$_o$ and R$_{oo}$ are not hydrogen, or R$_{oo}$ has its previous significance and R$_o$ is a residue of formula IV:

(IV)

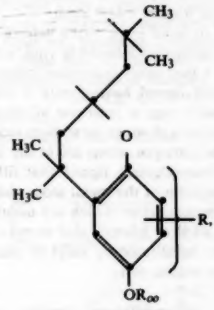


in which R, R_{oo}, R_1 and q have their previous significance, or R_o and R_1, when in ortho position to one another, together with the carbon atoms to which they are attached, may form an optionally substituted residue of formula V:

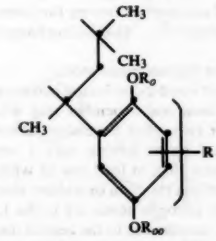
(V)

wherein A is a carbon residue containing 4 to 20 carbon atoms which forms a substituted chroman or coumaran system, or R_o and R_1 together form a residue having the formula VI or VII:

(VI)

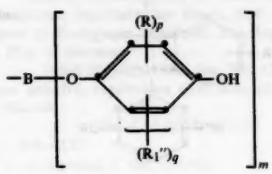


(VII)

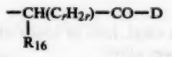


wherein R, R_o and R_{oo} have their previous significance, provided that the compound of formula I contains only one residue of formula III or IV; or R_{oo} is hydrogen and R_o is a residue having the formula IVa or IVb:

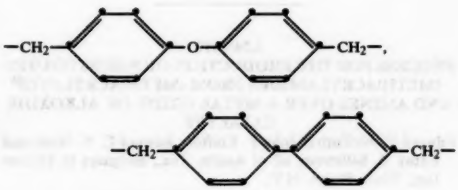
(IVa)



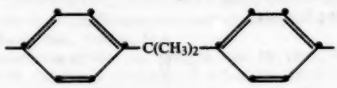
(IVb)



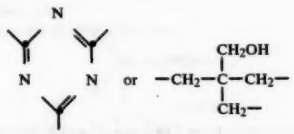
wherein p, q and R have their previous significance, R_1'' is C_1–C_8 straight or branched alkyl, C_7–C_9 aralkyl or a residue of formula II, as hereinbefore defined, m is 1 or 2, B, when m is 1, represents C_2–C_{12} alkylene which may be interrupted by 1 to 3 oxygen or sulphur atoms, C_4–C_{10} alkenylene, C_5–C_{12} cycloalkylene, C_6–C_{12} arylene, C_8–C_{12} aralkylene, C_4–C_6 alkynylene, xylylene, $-CH_2CH(OH)CH_2-$, $-CH_2CH(OH)CH_2-O-Y-O-CH_2CH(OH)CH_2-$,



wherein Y is C_2–C_{10} alkylene, C_6–C_{12} arylene,



or C_6–C_{12} cycloalkylene, B' is C_2–C_8 alkylene, C_4–C_8 oxaalkylene, or cyclohexylene and, when m is 2, B represents a group of the formula



r is 0 to 12, R_{16} represents hydrogen or straight or branched C_1–C_{12} alkyl and D is $-OR_4$ or $-N(R_4)(R_5)$ wherein R_4 and R_5 have their previous significance; or a salt of a compound of formula I with a base.

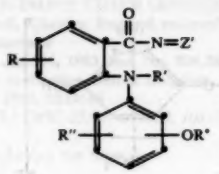
4,549,016

BENZYLOXY OR ALKOXY SUBSTITUTED PHENYLAMINOBENZAMIDES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 568,870, Jan. 6, 1984, Pat. No. 4,510,139.
This application Jan. 9, 1985, Ser. No. 690,013
Int. Cl.[4] C07C *103/28;* C07D *295/18*
U.S. Cl. 544—165 **17 Claims**

1. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, halo or lower-alkoxy;

R′ is hydrogen or lower-alkyl;

R″ is hydrogen, lower-alkyl or halo;

R° is (a) benzyl or (b) lower-alkyl when R is other than lower-alkoxy; and

N=Z′ is a member of the group consisting of benzylamino, N-benzyl-N-alkylamino having from eight to ten carbon atoms, 5- or 6-ring-membered cycloalkylamino having from five to eight carbon atoms, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, and lower-alkylated derivatives of said heterocyclic members.

4,549,017

PROCESS FOR THE PRODUCTION OF N-SUBSTITUTED (METH)ACRYLAMIDES FROM (METH)ACRYLATES AND AMINES OVER A METAL OXIDE OR ALKOXIDE CATALYST

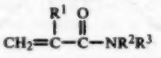
Edward E. McEntire; John F. Knifton; Edward C. Y. Nieh, and Kathy B. Sellstrom, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,010

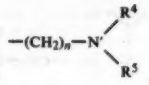
Int. Cl.[4] C07D *295/10;* **C07C** *102/06*

U.S. Cl. 544—168 **15 Claims**

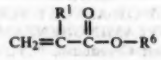
1. In a process for the preparation of N-substituted acrylamides of the formula:



where R^1 is hydrogen or methyl, R^2 is hydrogen or lower alkyl of 1 to 4 carbon atoms and R^3 is alkyl, aryl, alkaryl, aralkyl or alkoxyalkyl containing 1 to 20 carbon atoms or



where n is an integer from 2 to 6 and R^4 and R^5 taken singly are lower alkyl groups containing 1 to 4 carbon atoms or R^4 and R^5 taken jointly are combined with the N′ atom to form a heterocyclic ring group selected from the group consisting of morpholine, pyrrolidine or piperidine ring groups, which process comprises reacting a water-containing acrylate ester feedstock of the formula:



where R^1 is defined as above and R^6 is lower alkyl of 1 to 4 carbon atoms with a water-containing amine feedstock of the formula HNR^2R^3 where R^2 and R^3 are defined as above over a catalytic amount of a metal alkoxide catalyst having the formula:

(I) (II)

where M is a metal atom selected from the group consisting of lanthanum, niobium, tantalum, copper, zinc, tin, lead, antimony and bismuth, R^7 is a lower alkyl group of one to four carbon atoms, in formula I x and y are each zero through five and the sum of x+y is 2 to 5, depending on the valence of the metal, and in formula II y is 1 to 3 depending on the value of the metal,

the improvement which comprises pretreating said feedstocks with a C_1–C_4 tetralkoxide of silicon, titanium or zirconium prior to said reaction, the amount of said tetralkoxide used being at least stoichiometrically equivalent to the amount of water in said feedstocks.

4,549,018

RHODIUM-AND IRIDIUM-NITROGEN COMPLEX CATALYSTS

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 246,104, Mar. 20, 1981, Pat. No. 4,414,376. This application Aug. 11, 1983, Ser. No. 522,472

Int. Cl.[4] C07F *15/00;* **B01J** *31/20, 31/18, 31/22*

U.S. Cl. 544—225 **16 Claims**

1. Rhodium- and iridium-nitrogen complex compound selected from classes of compounds having the general formulae:

(a) monometallic complexes, $(L)MX(Y)_2$, and

(b) bimetallic complexes, (phenazine)$[RhX(CO)_2]$, wherein

M is a rhodium or iridium metal atom,

L is a single ring or fused 2-, or 3-ring heterocyclic ligand comprising at least one 6-member ring which can be fused to one or two other 6-member carbocyclic aromatic rings, said ligand having only 2 nitrogen ring atoms in the same ring, at least one of which nitrogen atoms is bonded to a rhodium or iridium atom, with the proviso that the nitrogen atoms are in the 1,4-position,

Y is uncharged monodentate ligand that fills only one coordination position of the metal atom and is selected from CO and mono-olefins which are unsubstituted or substituted by alkyl or phenyl, said mono-olefin being unsubstituted or substituted by alkyl or phenyl having up to 25 carbon atoms, and

X is Cl, Br, I, or Cn.

3. Rhodium- and iridium-nitrogen complex compounds selected from class of compounds having the formula:

monometallic complexes, (L)MX(uncharged ligand) wherein

M is a rhodium or iridium metal atom,

L is a single ring or fused 2-, or 3- ring heterocyclic ligand comprising at least one 6-member ring which can be fused to one or two other 6-member carbocyclic aromatic rings, said ligand having only 2 nitrogen ring atoms in the same ring, at least one of which nitrogen atoms is bonded to a rhodium or iridium atom, with the proviso that the nitrogen atoms are in the 1,4-position,

uncharged ligand coordinates to the central metal atom in the complex and is a di-olefin which occupies two coordination positions, said di-olefin being unsubstituted or substituted by alkyl or phenyl and having up to 25 carbon atoms, and

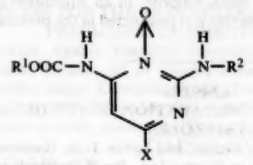
X is Cl, Br, I or CN.

4,549,019
PYRIMIDINECARBAMATE DERIVATIVES AS INTERMEDIATES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 1, 1982, Ser. No. 394,392
Claims priority, application Switzerland, Jul. 15, 1981, 4640/81; Mar. 12, 1982, 1559/82
Int. Cl.⁴ C07D *239/34*
U.S. Cl. 544—321 5 Claims

1. A compound of the formula



IV

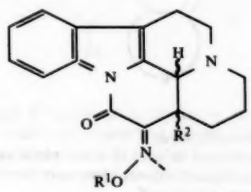
wherein X is p-toluenesulfonyloxy, benzenesulfonyloxy, p-bromobenzenesulfonyloxy or lower-alkylsulfonyloxy, R^1 is lower alkyl or lower alkoxy-lower alkyl, R^2 is hydrogen or —$COOR^3$ wherein R^3 is lower alkyl or lower alkoxy-lower alkyl, and R^1 and R^3 can be the same or different.

4,549,020
EBURNANE OXIME ETHERS

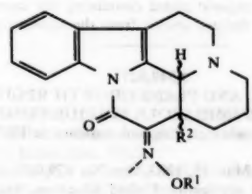
Csaba Szántay; Lajos Szabó ; Gyorgy Kalaus; János Sápi; Mária Zájer nee Balázs, all of Budapest; Bela Kiss, Vecses; Elemer Ezer, Budapest; Egon Karpati, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jun. 27, 1983, Ser. No. 508,437
Claims priority, application Hungary, Jun. 30, 1982, 2133
Int. Cl.⁴ C07D *461/00*
U.S. Cl. 546—51 3 Claims

1. A compound of the formulae (Ia) or (Ib)



(Ib)



in which

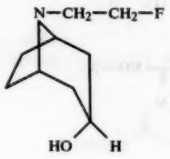
R^1 represents an alkyl group having 1 or 2 carbon atoms, and R^2 is ethyl or an acid addition salt thereof.

4,549,021
N-(β-FLUOROETHYL)-NORTROPINE

Rolf Banholzer, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 612,790
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1984, 3320138
Int. Cl.⁴ C07D *451/06*
U.S. Cl. 546—127 1 Claim

1. The compound of the formula



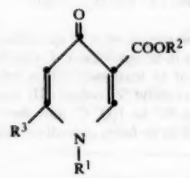
or an acid addition salt thereof.

4,549,022
4-PYRIDONE-3-CARBOXYLIC ACID DERIVATIVES

Alexander E. Wick, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 369,778, Apr. 19, 1982, Pat. No. 4,521,535, which is a continuation of Ser. No. 187,878, Sep. 17, 1980, abandoned, which is a continuation of Ser. No. 2,474, Jan. 10, 1979, abandoned. This application Nov. 2, 1984, Ser. No. 667,528
Claims priority, application Switzerland, Jan. 18, 1978, 512/78; Nov. 15, 1978, 11734/78
Int. Cl.⁴ C07D *401/04, 401/02, 403/02, 403/04*
U.S. Cl. 546—193 10 Claims

1. A compound of the formula:



I

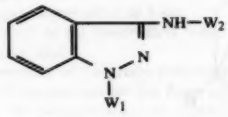
wherein R^1 is C_{1-8}-alkyl, C_{3-10}-cycloalkyl, C_{3-10}-cycloalkyl-C_{1-6}-alkyl, C_{1-6}-alkoxy or C_{1-6}-alkoxy-C_{1-6}-alkyl; R^2 is hydrogen or C_{1-6}-alkyl; R^3 is phenyl substituted by R^4, or an aromatic heterocyclic 6-membered ring containing one or more N-atoms, which is linked via a ring C-atom and which is optionally substituted, by R^7; R^4 is a 5-membered or 6-membered heterocyclic ring linked via a ring N- or C-atom; and R^7 is halogen, hydroxy, C_{1-6}-alkoxy, C_{1-6}-alkylthio, C_{1-6}-alkyl, amino, C_{1-6}-alkylamino or di-C_{1-6}-alkylamino: or a pharmaceutically acceptable salt thereof.

4,549,023
3-AMINOINDAZOLE DERIVATIVES

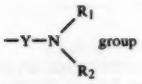
Tadayuki Ibuki; Taisuke Sugihara; Hiromu Kawakubo, and Takanori Sone, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 569,524, Jan. 9, 1984, Pat. No. 4,474,964, which is a continuation of Ser. No. 302,989, Sep. 17, 1981, abandoned. This application Jul. 31, 1984, Ser. No. 636,293
Claims priority, application Japan, Sep. 18, 1980, 55-128610; Sep. 19, 1980, 55-129090
Int. Cl.[4] C07D *401/12, 403/12*
U.S. Cl. 546—199 7 Claims

1. A compound of the formula (I):



wherein
W_1 a



wherein Y is a C_{1-6} alkylene group or a C_{1-6} alkylene group having a C_{1-6} alkyl group substituent; and R_1 and R_2 each independently is a hydrogen atom or a C_{1-6} alkyl group and R_1 and R_2 may form, together with the adjacent nitrogen atom, either a C_{4-6} fully saturated heterocyclic ring or a C_{4-6} fully saturated heterocyclic ring containing an additional nitrogen atom, and said fully saturated heterocyclic rings may have at least one C_{1-6} alkyl group, hydroxyl group or halogen atom as a substituent thereon; W_2 is a hydrogen atom; or a pharmaceutically acceptable acid addition salt thereof.

4,549,024
OXIDATION OF QUINOLINE TO QUINOLINIC ACID

Winfried Orth, Hassloch/Pfalz; Emmerich Pastorek, Hemsbach, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,219
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345223
Int. Cl.[4] C07D *213/807*
U.S. Cl. 546—320 6 Claims

1. A process for the preparation of quinolinic acid comprising reacting quinoline in an aqueous acid with hydrogen peroxide in the presence of at least one cation selected from the group consisting of vanadyl V, cobalt III, titanyl IV and osmium VIII cations at 50° to 100° C. and then oxidizing with chlorite or chlorate ions to form quinolinic acid.

4,549,025
PROCESS FOR OXIDIZING ALDEHYDES TO CARBOXYLIC ACIDS

Enrico Dalcanale; Giorgio Bottaccio; Stefano Campolmi, all of Novara, and Fernando Montanari, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 12, 1984, Ser. No. 680,825
Claims priority, application Italy, Dec. 16, 1983, 24202 A/83
Int. Cl.[4] C07C *51/285;* C07D *213/807*
U.S. Cl. 546—327 9 Claims

1. A process for oxidizing aromatic, heteroaromatic and aliphatic aldehydes having the general formula:

R-CHO

wherein R is selected from the class consisting of aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroarylalkyl, heteroarylalkenyl, heteroarylalkynyl, alkyl, alkenyl, and alkynyl, optionally substituted by substituents which are inert under the reaction conditions, to the corresponding acids of the general formula:

R-COOH

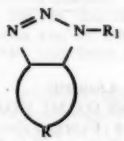
wherein R is the same as defined above, by means of an alkali metal or alkaline-earth metal chlorite, in an aqueous-organic medium, characterized in that it is conducted in the presence of hydrogen peroxide.

4,549,026
PROCESS FOR THE PREPARATION OF CONDENSED TRIAZOLES

Michel Deur, Mulhouse, France, and Istvan Toth, Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

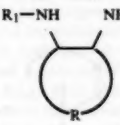
Filed Mar. 2, 1982, Ser. No. 353,872
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108405
Int. Cl.[4] C07D *249/18, 249/20*
U.S. Cl. 548—257 23 Claims

1. A process for the preparation of a condensed triazole of the formula I



I

in which
R together with the carbon atoms to which R is attached forms a group of aromatic character and
R_1 is hydrogen or a hydrocarbon group, the process comprising reacting at up to 80° C., under cooling, a compound of formula II



II

where
R and R_1 are above defined,
an inorganic nitrite and an acid in a two phase system, one phase being an organic solvent phase and the other phase being an aqueous phase, and
separating the organic phase containing the compound of formula I, as defined above, from the aqueous phase.

4,549,027
FUNGICIDAL AND PLANT GROWTH REGULANT TRIAZOLE AND IMIDAZOLE SULFIDE COMPOUNDS

Peter S. Gates, Cambridge, England, assignor to FBC Limited, England

Filed Mar. 25, 1983, Ser. No. 479,060
Claims priority, application United Kingdom, Apr. 1, 1982, 8209726
Int. Cl.[4] A01N *43/50, 43/64;* C07D *233/60, 249/08*
U.S. Cl. 548—262 1 Claim

1. A compound selected from

1-[1-(4-chlorophenylthio)-2-methyl-2-phenylpropyl]-1H-imidazole,
1-[1-(4-chlorophenylthio)-2-methyl-2-phenylpropyl]-1H-1,2,4-triazole,
1-[1-(2,4-dichlorophenylthio)-2-methyl-2-phenylpropyl]-1H-1,2,4-triazole, and acid addition salts or complexes thereof with a metal salt.

4,549,028

PROCESS FOR THE PREPARATION OF HYDANTOIN PRECURSOR OF PHENYLALANINE

Mitsukuni Ayabe; Tunehiko Shimizui; Iwao Kibayashi, and Hideki Hirano, all of Tokyo, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,288
Claims priority, application Japan, Apr. 22, 1983, 58-70147
Int. Cl.[4] C07D *233/74*
U.S. Cl. 548—308 **4 Claims**

1. A process for the preparation of a mixture of precursors of phenylalanine containing as a major component 5-benzylhydantoin, which comprises reacting in an aqueous medium, a bisulfite addition salt of phenylacetaldehyde with cyanide and carbonate ions, each being in a molar ratio of equimol or more to said bisulfite addition salt and ammonium ions in a molar ratio of greater than 2 to said carbonate ion.

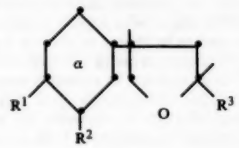
4,549,029

SUBSTITUTED TETRAHYDROFURANS

Alan R. Hochstetler, Glen Rock, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Apr. 5, 1983, Ser. No. 482,353
Int. Cl.[4] C07D *307/06*
U.S. Cl. 549—429 **2 Claims**

1. A compound of the formula



I

wherein:

R^1, R^2 and R^3 represent hydrogen or methyl and may be alike or different except that R^1 and R^2 are different, and the six-membered ring designated by α is a benzene ring, a cyclohexadiene ring, a cyclohexene ring or a cyclohexane ring.

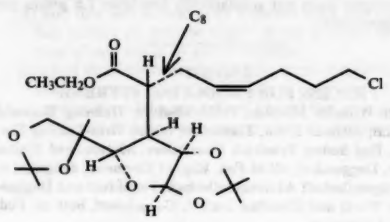
4,549,030

ORGANIC COMPOUNDS AND PROCESS

Bruce A. Pearlman, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 449,115, Dec. 13, 1982,. This application Oct. 31, 1983, Ser. No. 547,317
Int. Cl.[4] C07D *317/44*
U.S. Cl. 549—435 **1 Claim**

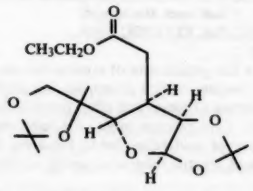
1. A process for preparing a prostaglandin intermediate of the formula A-6



A-6

which comprises:

(a) treating a compound of the formula A-5



A-5

with a weakly nucleophilic strong base in an inert solvent, and, subsequently

(b) reacting the formula A-5 compound with an alkylating agent of the formula B-4

B-4

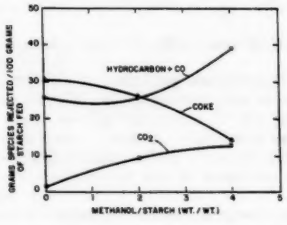
at a temperature in the range of about −110° to about 0° C.

4,549,031

CONVERSION OF CARBOHYDRATES

Nai Y. Chen, Titusville, and Leonard R. Koenig, Mercerville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 574,638, Jan. 30, 1984, Pat. No. 4,503,278, which is a continuation-in-part of Ser. No. 430,461, Sep. 30, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,496
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—408 **11 Claims**



1. A process for the conversion of an aqueous solution of carbohydrates to hydrocarbons which comprises contacting a feed stream consisting essentially of an aqueous solution of carbohydrate with a crystalline zeolite catalyst in a cyclic fluid bed operation involving cracking and regeneration at a temperature of 300° C. to 650° C. and space velocity (WHSV) of 0.5 to 5 for a period of time not exceeding 10 minutes, and thereafter recovering a hydrocarbon product of increased carbon content; said catalyst being characterized as having a

constraint index of about 1 to 12 and a dried crystal density in the hydrogen form not substantially less than 1.6 grams per cubic centimeter.

4,549,032

PROCESS FOR PRODUCING STYRENE

Friedrich-Wilhelm Moeller, Friedrichsdorf; Henning Buchold, Maintal; Helmut Klein, Hanau am Main; Otto-Ludwig Garkisch, Bad Soden; Friedrich Guetlhuber, Metten, and Walter Laber, Deggendorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt and Deggendorfer Werft und Eisenbau GmbH, Deggendorf, both of, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,595

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319024

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

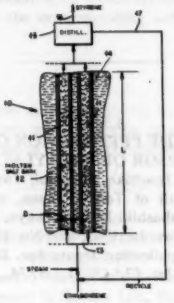
Int. Cl.[4] C07C *5/36*

U.S. Cl. 585—445 **10 Claims**

1. A process for the production of styrene by the dehydrogenation of ethyl benzene which comprises the steps of:

(a) feeding a mixture of steam and ethyl benzene in a weight ratio of 0.5 to 1, to reactor tubes of a tube reactor, the inside diameter of said tubes being between 20 and 35 millimeters, said reactor tubes containing a dehydrogenation catalyst;

(b) heating said tubes and indirectly heating the catalyst contained therein by a molten salt bath having a temperature in the range of 580° C. to 660° C., the temperature of said bath being not more than 20° C. in excess of the reaction temperature at said catalyst; and



(c) effecting a dehydrogenation reaction of said ethyl benzene on said catalyst to convert 65 to 75 mole percent of the ethyl benzene of said mixture to styrene.

4,549,033

ENCAPSULATION OF PHOTOCELLS WITH ACRYLIC PREPOLYMER

Michel Avenel, Gisors; Paul Evrard, Fourqueux, and Jean-Paul Leca, Mantes la Jolie, all of France, assignors to Societe Chimique des Charbonnages-CdF CHIMIE, Paris, France

Division of Ser. No. 354,922, Mar. 5, 1982, Pat. No. 4,424,137.
This application Sep. 27, 1983, Ser. No. 536,268
Claims priority, application France, Mar. 5, 1981, 81 04392
Int. Cl.[4] H01L *31/04;* B29C *6/00*
U.S. Cl. 136—251 5 Claims

1. A process for producing a panel encapsulating a plurality of photocells connected to one another by conducting wires comprising positioning said photocells in a space between a support plate and a second protective plate, mixing 100 parts of an acrylic prepolymer comprising:

(1) from 10 to 50% by weight of units derived from at least one alkyl acrylate, the alkyl group having from 4 to 12 carbon atoms,

(2) from 30 to 60% by weight of units derived from at least one alkyl methacrylate, the alkyl group having from 1 to 5 carbon atoms, and

(3) from 10 to 40% by weight of units derived from methyl acrylate,

with from 0.1 to 4 parts of vanadium arenesulphonate, and from 0.5 to 4 parts of a free-radical initiator to form a polymeric resin, casting said resin into said space, and maintaining said cast resin at a temperature between 10° and 70° C. for a sufficient time to solidify the polymeric resin.

5. A panel of encapsulated photocells made by the process of claim 1.

4,549,034

REFINED ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,654
Claims priority, application Japan, Dec. 30, 1983, 58-250736
Int. Cl.[4] H01B *3/22;* H01G *4/22*
U.S. Cl. 17—17 LF 9 Claims

1. A refined electrical insulating oil which is prepared by refining a mixture using a solid acidic substance, said mixture comprising 1 to 70% by weight of at least one bicyclic monoolefin selected from the group consisting of unsaturated dimers or unsaturated codimers of styrenes such as styrene, α-methylstyrene and their monomethyl nuclear substituted compounds and the remainder of alkyl (including cycloalkyl) biphenyl and/or alkyl (including cycloalkyl) naphthalene.

4,549,035

AERODYNAMIC DAMPER FOR SUPPRESSING GALLOPING IN OVERHEAD TRANSMISSION LINES

Leib Zaltsberg, 6319 N. Sacramento Ave., Chicago, Ill. 60659

Filed Oct. 19, 1983, Ser. No. 543,343
Int. Cl.[4] H02G *7/14*
U.S. Cl. 174—42 15 Claims

1. An aerodynamic damper for damping galloping motion of an aerial electrical conductor comprising:

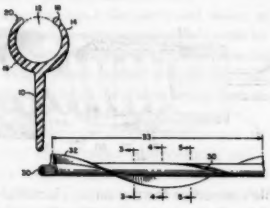
(a) an elongated vane having first and second ends, upper and lower surfaces, and first and second sides;

(b) a first arm connected to the first side of the vane at said upper surface and extending laterally and upwardly of the vane in a first direction, said first arm being arcuate in shape and having an arcuate length about ⅛ of the circumference of a circle of a given diameter;

(c) a second arm connected to the second side of the vane at said upper surface and extending laterally and upwardly of the vane in a second direction opposite to said first direction, said second arm being arcuate in shape and having an arcuate length about ⅛ of the circumference of said circle of given diameter;

(d) said first and second arms together with said upper surface having an arcuate length about ¼ of the circumference of said circle of given diameter;

(e) a first lip of substantially circular cross-section connected to the first arm at an end opposite to the vane and forming an extension of the arc defined by said first arm, the diameter of said first lip being greater than the transverse cross-



sectional dimension of said first arm at a location where the first lip is connected to said first arm; and

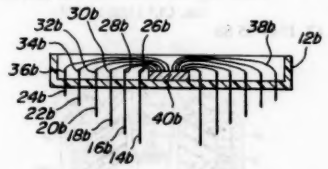
(f) a second lip of substantially circular cross-section connected to the second arm at an end opposite to the vane and forming an extension of the arc defined by said second arm, the diameter of said second lip being greater than the transverse cross-sectional dimension of said second arm at a location where the second lip is connected to said second arm.

4,549,036

CIRCULAR INTEGRATED CIRCUIT PACKAGE

Morris M. Reichbach, 825 Woodland Dr., Lakewood, N.J. 08701

Filed Jul. 23, 1984, Ser. No. 633,487
Int. Cl.[4] H01L *23/50*
U.S. Cl. 174—52 FP 1 Claim



1. A circular integrated circuit package, comprising in combination:

(a) an insulating header to which may be bonded an integrated circuit;

(b) a multiplicity of connecting pins arranged in concentric circles wherein said connecting pins protrude through said header so that the portion of said pins protruding above said header may be connected to pads located on said integrated circuit and the portion of said pins protruding below said header may be connected to an external circuit; and,

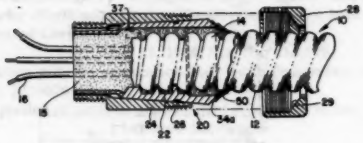
(c) means for keying said circular integrated package so that said package may be mounted to a printed circuit board in one position only, wherein said portion of said pins protruding below said header have differing lengths; wherein said length protruding below said header of any of said pins located on the circumference of any given circle of pins is equal to the length protruding below said header of every other pin located on the circumference of the same said circle of pins; and, said length protruding below said header of each of said pins decreases as the radial distance to the center of said concentric circles increases.

4,549,037

ENVIRONMENTALLY SEALED CABLE CONNECTOR

Jaspal S. Bawa, Neshanic Station; Luis R. Couto, Hillside; Edward S. Rapacki, Carteret; Alfred Wood, Cranford, all of N.J., and Walter A. Pobuta, deceased, late of Elizabeth, N.J. (by Grace Pobuta, executrix), assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 30, 1982, Ser. No. 432,055
Int. Cl.⁴ H02G *3/06*
U.S. Cl. 174—65 SS **22 Claims**



1. A cable connector for use on an electrical cable having a plurality of conductors extending therethrough, the connector comprising:

a body having a cable receiving end, a conductor egressing end and a central cavity extending therethrough;

a hollow member extending within said central cavity having an opening adjacent said conductor egressing end for receiving conductor surrounding material therein, said hollow member including means for securement to said electrical cable;

channel means on said hollow member, separate from said securement means for passage of said conductor surrounding material through said hollow member; and

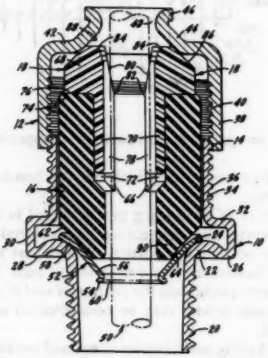
means for effecting a seal between said cable and said body.

4,549,038

CORD GRIP

Fred Masheris, Elgin; Leonard H. Michaels, Warrenville; William J. Scott, Sycamore, and Roy N. Voss, Fairdale, all of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Aug. 22, 1983, Ser. No. 524,868
Int. Cl.⁴ H02G *3/22*
U.S. Cl. 174—65 SS **9 Claims**



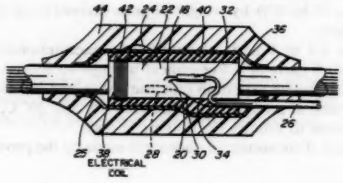
1. In a cord grip, interfitting parts defining a generally annular compression chamber with a cord receiving central passage therethrough, the parts being screw fitted together so that relative rotation of one relative to the other reduces the axial dimension and therefore the volume of the chamber, a gripper unit in the chamber constructed to perform a closing and gripping action on a cord in response to reduction in the volume of the chamber, a distortable generally annular grommet in the rear of the chamber in contact with and functioning to cause a compressive axial load to be applied by the gripper unit on a cord in response to reduction in the volume of the compression chamber, opposed bevel surfaces on one end of the grommet and compression chamber constructed and arranged to be pressed against each other in response to reduction in the volume of the compression chamber, and an O-ring formation on the beveled surface of the grommet arranged to take the initial load resulting from reduction in the compression chamber volume prior to contact between the remainder of the opposed beveled surfaces so that an area of concentrated seal effect is provided.

4,549,039

TELECOMMUNICATIONS CABLE SPLICE CLOSURES

Leonard J. Charlebois, and James E. Anderson, both of Ontario, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 10, 1983, Ser. No. 503,359
Int. Cl.⁴ H02G *15/08;* **G01V** *3/10;* **G01R** *19/145*
U.S. Cl. 174—72 R **8 Claims**



1. A telecommunications cable having a plurality of insulated conductors and a splice closure comprising at least two insulated conductors which are severed at the splice to electrically disconnect first parts of these conductors extending from the splice region in one axial direction from second parts extending in the other axial direction, each of said first parts provided to have an electrical connection to an insulated conductor of another cable, a closure around the cable splice region to prevent moisture access to the inside of the cable or to bared electrical conductors at the connection, and a plurality of electrical conductor windings providing a coil which is electrically connected between and in series with said second conductor parts.

5. A method of making a splice closure in a telecommunications cable comprising:

selecting two insulated conductors of the core of the cable and severing the conductors at a splice region to electrically disconnect first parts of these conductors extending from the splice region in one axial direction from second parts extending in the opposite axial direction; electrically connecting in series between the second conductor parts, a plurality of electrical conductor windings to provide a coil between said second parts, the first conductor parts provided for electrical connection to an insulated conductor of another cable; and forming a closure around the splice region either before or after connecting the coil in series with the second conductor parts.

4,549,040

SPLICE CASE

Erwin H. Goetter, Chesterland, Ohio, assignor to Preformed Line Products Company, Mayfield Village, Ohio

Filed Mar. 21, 1984, Ser. No. 591,943
Int. Cl.⁴ H02G *15/113*
U.S. Cl. 174—92 **21 Claims**

1. A splice case for cables or the like comprising:

a pair of splice case members reversely positioned in cooperating relationship to define a hollow splice case;

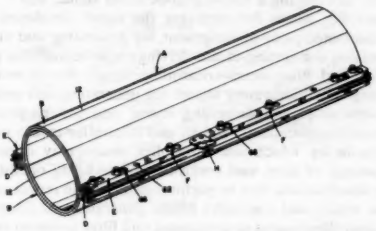
each said splice case member having outwardly extending opposite flanges along the length thereof;

said splice case members being positioned with said flanges thereon opposed to one another to define a pair of cooperating flanges on each of opposite sides of said splice case;

a pair of elongated fastener strips extending along opposite sides of each said pair of cooperating flanges;

fastener assemblies for clamping each said pair of fastener strips together to thereby compress the pair of flanges received therebetween;

each said fastener strip having at least one longitudinal leg projecting therefrom;



each said pair of fastener strips being positioned with said at least one longitudinal leg on each said strip extending toward one another in opposed relationship; and,

each said flange having a longitudinal groove, said groove contiguous with the longitudinal groove in its cooperating flange and receiving in said groove the at least one longitudinal leg on an associated one of said fastener strips to faciliate said cooperating flanges being securely clamped together by said fastener assemblies.

4,549,041

FLAME-RETARDANT CROSS-LINKED COMPOSITION AND FLAME-RETARDANT CABLE USING SAME

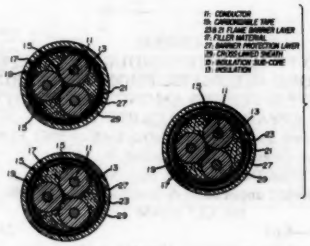
Yoshioki Shingo, Numazu; Takao Matsuda, Mishima; Akira Yoshino, Shizuoka; Hideo Sunazuka, Kamagaya; Masatake Hasegawa, Tokyo, and Hirotada Kobayashi, Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,157

Claims priority, application Japan, Nov. 7, 1983, 58-207393; Mar. 7, 1984, 59-043138

Int. Cl.[4] H01B *7/02, 3/30;* **C09K** *3/28*

U.S. Cl. 174—113 R **18 Claims**



1. A flame-retardant cross-linked composition produced by:

(a) mixing a first compound of a polyolefin resin and a metallic hydrate with a silane-grafted polyolefin resin to form a second compound, both the resins being free of any halogen;

(b) silane cross-linking the second compound to form the flame-retardant cross-linked composition; and

(c) wherein the metallic hydrate is mixed in an amount of about 50 to about 200 parts by weight per 100 parts by weight of both the polyolefin resin and the silane-grafted polyolefin resin, and

the polyolefin resin is mixed in an amount of about (100−x) parts by weight wherein x is the amount of the silane-grafted polyolefin resin and is $20 \leqq x \leqq 80$ parts by weight.

7. A flame-retardant cable comprising:

(a) a core including one subcore or more than one subcore twisted together, the subcore having a conductor coated with an electrical insulation, the insulation being made of a material free from any halogen; and

(b) a sheath provided over the core and made of a flame-retardant cross-linked composition produced by:

(c) mixing a first compound of a polyolefin resin and a metallic hydrate with a silane-grafted polyolefin resin to form a second compound, both the resins being free of any halogen;

(d) silane cross-linking the second compound to form the flame-retardant cross-linked composition; and

(e) wherein the metallic hydrate is mixed in an amount of about 50 to about 200 parts by weight per 100 parts by weight of both the polyolefin resin and the silane-grafted polyolefin resin, and the polyolefin resin is mixed in an amount of about (100−x) parts by weight wherein x is the amount of the silane-grafted polyolefin resin and is $20 \leqq x \leqq 80$ parts by weight.

4,549,042

LITZ WIRE FOR DEGREASING SKIN EFFECT AT HIGH FREQUENCY

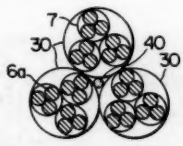
Yutaka Akiba, Fujisawa, and Kazuo Hirota, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1982, Ser. No. 404,567

Claims priority, application Japan, Jul. 31, 1981, 56-119051

Int. Cl.[4] H01B *7/30;* **G01R** *33/02*

U.S. Cl. 174—114 R **13 Claims**



6. In a litz wire for conducting high frequency current comprising a plurality of insulating strands which are twisted to form said wire, each of said strands consisting essentially of an inner conductor and an outer insulating layer on said conductor, the improvement comprising said wire being formed by twisting said strands about an insulated axial member disposed along a center line of the litz wire with each of the strands being arranged concentrically in said litz wire and the number of said strands in said litz wire being at least four.

11. In a litz wire for conducting high frequency current comprising a plurality of insulated strands which are twisted to form said wire, each of said strands consisting essentially of an inner conductor and an outer insulating layer on said conductor, the improvement comprising at least one fundamental unit wire of said litz wire formed with at least three of said insulated strands, each of said insulated strands of said fundamental unit wire being concentrically arranged with respect to and twisted about the center line of said fundamental unit wire as seen in cross section whereby the loss resistance of the litz wire due to the skin effect when a high frequency current is conducted by said litz wire is greatly reduced.

4,549,043

ELECTRONIC CONDUCTOR AND A METHOD OF MANUFACTURING IT

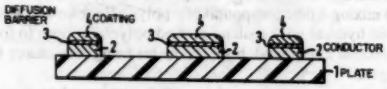
Prematilaka W. Kalubowila, London; Stanislaw P. Wach, Kent, and Michael B. Levens, Chester, all of United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 4, 1984, Ser. No. 568,020

Claims priority, application United Kingdom, Jan. 19, 1983, 8301385

Int. Cl.⁴ H01B *1/02, 5/02, 5/14*

U.S. Cl. 174—133 R **9 Claims**



1. An electronic circuit board conductor comprising: a base made substantially of copper; a diffusion barrier comprising copper in combination with phosphorus or with boron disposed on said base; and a coating of substantially tin disposed on said diffusion barrier.

4. A method of manufacturing an electronic conductor, comprising: applying copper in combination with phosphorus to a base made substantially of copper by an electro-deposition process to form a diffusion barrier thereon, and then applying a coating of substantially tin on said diffusion barrier.

7. A method of manufacturing an electronic conductor comprising: applying copper in combination with boron to a base made substantially of copper by an electro-deposition process to form a diffusion barrier thereon, and then applying a coating of substantially tin on said diffusion barrier.

4,549,044

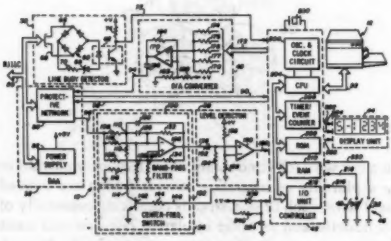
REMOTE TELEMETRY UNIT

Stephen J. Durham, Cupertino, Calif., assignor to Cermetek Microelectronics, Inc., Sunnyvale, Calif.

Filed Oct. 6, 1983, Ser. No. 539,568

Int. Cl.⁴ H04M *11/04*

U.S. Cl. 179—5 R **8 Claims**



1. A remote-telemetry unit for reporting the state of at least one signal developed by an associated piece of equipment to a remote location over a telephone line, the unit comprising in combination:

digital-to-analog-converting means responsive to a plurality of digital-to-analog-converting-means-driving digital signals and operative to generate a corresponding analog signal;

filter means having a state in which said filter means passes originate-tone signals and rejects answer-tone signals and a state in which said filter means passes answer-tone signals and rejects originate-tone signals, said filter means being responsive to a filter-means-controlling signal and operative to switch between said states;

protective-network means having an on-hook state in which said protective-network means develops a ring-signal-indicating signal when a ring signal is developed on the telephone line and an off-hook state in which said protective-network means permits an off-hook current to flow through said telephone line, couples said digital-to-analog-converting means developed analog signals to said telephone line and couples signals developed on said telephone line to said filter means, said protective-network means being responsive to a protective-network-means-controlling signal and operative to switch between said on-hook and said off-hook states;

detector means connected to said filter means, said detector means for detecting tone signals which are generated on said telephone line and which are passed by said filter means and for developing a tone-signal-detected signal; and

controller means for receiving the signal developed by the associated piece of equipment, for generating said digital-to-analog-converting-means-driving digital signals, for generating said filter-means-controlling signal, for receiving said ring-signal-indicating signal, for generating said protective-network-means-controlling signal and for receiving said tone-signal-detected signal, said controller means including means by which said controller means may measure the passage of time, said controller means being operative at a predetermined time to perform an originate report sequence in which said controller means generates said filter-means-controlling signal so as to cause said filter means to switch to the state in which said filter means passes answer-tone signals, generates said protective-network-means-controlling signal so as to cause said protective-network means to switch to said off-hook state, generates said digital-to-analog-converting-means-driving digital signals so as to cause said digital-to-analog-converting means to develop on said telephone line a sequence of signals suitable for dialing the remote location, and upon receipt of said tone-signal-detected signal generates said digital-to-analog-converting-means-driving digital signals so as to cause said digital-to-analog-converting means to develop on said telephone line a sequence of signals suitable for indicating the state of said associated equipment developed signal, and said controller means being responsive to said ring-signal-indicating signal and operative to perform an answer report sequence in which said controller means generates said filter-means-controlling signal so as to cause said filter means to switch to the state in which said filter means passes originate-tone signals, generates said protective-network-means-controlling signal so as to cause said protective-network means to switch to said off-hook state, and upon receipt of said tone-signal-detected signal generates said digital-to analog-converting-means-driving digital signals so as to cause said digital-to-analog-converting means to develop on said telephone line said associated equipment signal state indicating sequence of signals.

4,549,045

METHOD TO OPERATE THROUGH A TELEPHONE LINE ONE AUTOMATIC PHONE ANSWERING EQUIPMENT SPECIFIED AMONG A PLURALITY, AND APPARATUS TO CARRY IT OUT

Marcelo Castro, and Horacio Castro, both of 5962 El Salvador St., Buenos Aires (1414), Argentina

Filed Dec. 14, 1982, Ser. No. 449,611

Claims priority, application Argentina, Dec. 18, 1981, 287866

Int. Cl.⁴ H04M *1/64*

U.S. Cl. 179—6.03 **26 Claims**

1. A method for operating, through a phone line, one of a plurality of automatic phone answering devices, wherein the method comprises the steps of:

(A) sending from the calling end of said phone line characters corresponding to the phone number of the called party;

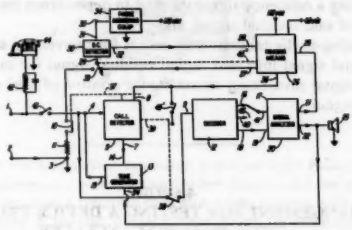
(B) detecting at the called end the pulse trains generated by the phone exchange;

(C) closing automatically and electrically the d.c. loop at the called end, connecting in parallel with said phone line an electric impedance means equivalent to the impedance

offered to said phone line by a conventional phone which has an unhooked phone set;

(D) in response to the closure of the d.c. loop, sending automatically a confirmation tone from the called apparatus to the calling one;

(E) after closure of the d.c. loop, or if no code has been received, or else, an incomplete code, from the calling party within a predetermined period of time, activating at the called end said one automatic phone answering equipment and connecting it to said phone line and, if a code has been received from the calling party within said predetermined period of time, emitting one audible warning signal if the received code is the preset one, and exhibiting said complete code received at the called end without yet connecting the automatic phone answering equipment;



(F) if, after a second predetermined period of time has elapsed, the called party has not attended the call, automatically activating the automatic phone answering equipment and connecting it to said phone line; and

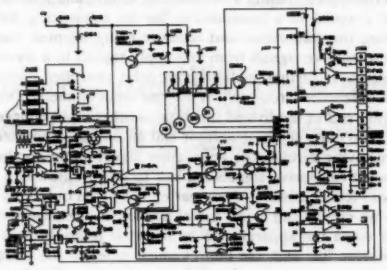
(G) when another predetermined period of time has elapsed, the called party not having answered, automatically opening the d.c. loop.

4,549,046

TELEPHONE ANSWERING SYSTEM WITH REMOTE CONTROL CAPABILITIES

Gerald L. Mock, Corona, and Bradford E. Hanscom, Downey, both of Calif., assignors to T.A.D. Avanti, Inc., Compton, Calif.

Filed Aug. 15, 1983, Ser. No. 523,115
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.11 **11 Claims**



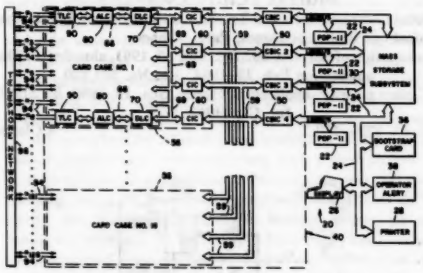
1. In a telephone answering system which responds to telephone messages received over a telephone line and which includes a first magnetic tape mechanism (T-1) having a recorded announcement thereon to be transmitted over the telephone line to a caller during a time interval (T_1) in response to a telephone call, and a second magnetic tape mechanism (T-2) for recording messages received over the telephone line during a second time interval (T_2) following the time interval (T_1), and which responds to a remote control signal received over the telephone line from a caller during the T_1 or T_2 time intervals to effectuate predetermined control operations; the combination of: a microcomputer; circuit means adapted to be coupled to the telephone line for receiving the remote control signal transmitted over the telephone line and for introducing the remote tone to the microcomputer; a beep oscillator circuit connected to the microcomputer to be turned on and off by the microcomputer and being coupled to the telephone line for transmitting beep tone signals over the telephone line and connected to the first magnetic tape mechanism (T-1) for recording said beep tone signals on the T-1 tape mechanism; an input circuit adapted to be coupled to the telephone line for receiving audio signals therefrom; an output circuit for coupling the system to the telephone line for transmitting audio signals to the telephone line; a first circuit connecting the microcomputer to the T-2 tape mechanism to cause the T-2 tape mechanism to move in a forward direction; a second circuit connecting the microcomputer to the T-2 tape mechanism to cause the T-2 tape mechanism to move in a reverse direction; a third circuit connecting the microcomputer to the T-1 tape mechanism to cause the T-1 tape mechanism to move in a forward direction; a fourth circuit connecting the microcomputer to the T-1 tape mechanism to cause the T-1 tape mechanism to move in a reverse direction; said microcomputer responding to the remote control signal received from a caller over the telephone line during the T_2 interval to cause said beep oscillator to transmit at least one beep tone signal over the telephone line to the caller; and said microcomputer responding to the remote tone signal from a caller received over the telephone line during the T_1 interval to cause the third circuit to stop the forward motion of the T-1 tape, and to cause the beep oscillator to transmit at least one beep tone over the telephone line to the caller.

4,549,047

DIGITIZED VOICE MESSAGE STORAGE SYSTEM

Dow V. Brian, Menlo Park, and Samuel R. Hawes, Palo Alto, both of Calif., assignors to Voicemail International, Inc., Santa Clara, Calif.

Filed Jul. 22, 1982, Ser. No. 400,936
Int. Cl.[4] G06F *1/00;* **H04M** *3/50*
U.S. Cl. 179—18 B **19 Claims**



1. A digitized voice message storage system for receiving analog signals from and transmitting analog signals to a telephone network, having a plurality of telephone lines, the analog signals which said digitized voice message storage system receives from the telephone network presenting a command to said digitized voice message storage system or a message to be digitized and stored within said digitized voice message storage system, and the analog signals which said digitized voice message storage system transmits to the telephone network presenting a command to the telephone network or a message for transmission via the telephone network which message was previously digitized and stored within said digitized voice message storage system, said digitized voice message storage system comprising:

digital computer means for supervising the overall opera-

tions of said digitized voice message storage system, said digital computer means including processor means for processing digital data, digital memory means for storing digital data, and bus means for transferring digital data between said digital computer means and other devices connected to the bus means;

mass storage subsystem means operated under the supervision of said digital computer means for storing and retrieving digital data, said mass storage subsystem means being connected to the bus means of said digital computer means for exchanging digital data therewith; and

telephone signal conversion subsystem means operated under the supervision of said digital computer means, said telephone signal conversion subsystem means including:

signal conversion sub-subsystem means for converting between analog signals of the telephone network and digital data suitable for processing by the processor means of said digital computer means or for storage in said mass storage subsystem means, said signal conversion sub-subsystem means including digital memory means into which is stored digital data obtained by converting an analog signal received from said telephone network, and from which is retrieved digital data for generating an analog signal to be transmitted to said telephone network; and

computer interface means interconnecting said signal conversion sub-subsystem means and the bus means of said digital computer means, said computer interface means selectively coupling said bus means of said digital computer means to the digital memory means of said signal conversion sub-subsystem means whereupon said signal conversion sub-subsystem means during such selective coupling of the digital memory means included therein to said bus means becomes a selected signal conversion sub-subsystem means, said computer interface means and said bus means directly transferring blocks of digital data between said mass storage subsystem means and the digital memory means of said selected signal conversion sub-subsystem means through said computer interface means without temporarily storing such blocks of digital data within said computer interface means.

4,549,048

DIGITAL ECHO CANCELLER

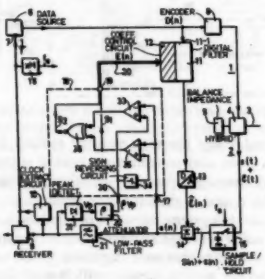
Michel Combier, Choisy le Roi, France, assignor to Telecommunications Radioelectriques, Paris, France

Continuation of Ser. No. 302,281, Sep. 15, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 581,220

Claims priority, application France, Sep. 19, 1980, 80 20251

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 179—170.2 **4 Claims**



1. In echo cancelling means connected between transmitting circuit means carrying first information signals for transmission to a remote station and receiving circuit means, for cancelling echo signals occurring in said receiving circuit means in response to said first information signals, said echo cancelling means having controllable digital signal processing means with associated control circuit means connected to said transmitting circuit means for furnishing a synthetic echo signal in response to a digital residual signal and said first information signals, sampling means for sampling said received signal thereby creating a sampled received signal, and difference circuit means connected to said digital signal processing means and said sampling means for furnishing a residual signal corresponding to the difference between said sampled received signal and said synthetic echo signal, the improvement comprising

means connected to said difference circuit means for furnishing a reference signal varying in dependence on the level of said residual signal; and

analog-to-digital converter means for converting said residual signal into said digital residual signal for said digital signal processing means under control of said reference signal.

4,549,049

ARRANGEMENT FOR TESTING A DEVICE PROVIDED WITH AN ECHO CANCELLER

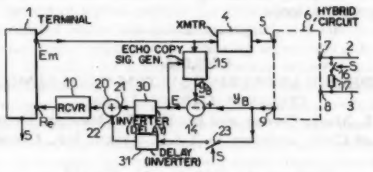
Loïc B. Y. Guidoux, Plessis Robinson, France, assignor to Telecommunications Radioelectriques et Telephoniques, Paris, France

Continuation of Ser. No. 368,781, Apr. 15, 1982, abandoned, which is a continuation of Ser. No. 117,188, Jan. 31, 1980, abandoned. This application Jul. 18, 1983, Ser. No. 514,540

Claims priority, application France, Feb. 5, 1979, 79 02903

Int. Cl.⁴ H04M *1/24;* **H04B** *17/00, 3/46*

U.S. Cl. 179—175.31 E **11 Claims**

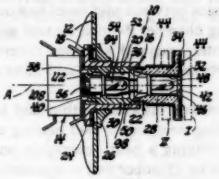


1. In an arrangement for facilitating the testing of an apparatus of the type including a transmitting circuit and a receiving circuit coupled to a transmission line by means of a hybrid junction, the transmitter and receiver being adapted respectively to receive signals from and apply signals to a terminal, the apparatus further including an echo canceller provided with a difference circuit which has one input connected to the receiving end of the hybrid junction, another input connected to an echo copy signal generator and an output connected to said receiving circuit, the echo copy signal generator being connected to receive signals applied to said transmitting circuit, said test consisting of comparing the signal output by the receiving circuit and a test signal applied to the transmitting circuit when the apparatus to be tested is fedback from the transmission line end, the improvement wherein the arrangement comprises an adder circuit, means coupling a first input of the adder circuit to the output of the difference circuit, the adder circuit having an output coupled to the input of the receiving circuit, said coupling means further coupling a second input of the adder circuit to the receiving end of the hybrid junction by means of an interrupter circuit adapted to be closed only during a test, said coupling means comprising means for altering the signal to be output by the receiving circuit such that the output signal, when the test signal is applied to the transmission circuit, is different from the test signal applied to the transmission circuit and different from the output of the difference circuit.

4,549,050
ILLUMINATED CONTROL KNOB FOR ELECTRIC SWITCH

Paul R. Lang, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1984, Ser. No. 622,540
Int. Cl.[4] H01H 9/16
U.S. Cl. 200—314 3 Claims

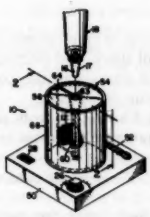


1. An electric switch including a pair of light bulbs one of which serves as a switch locator when lighted and the other of which serves as a function indicator when lighted, said switch comprising a tubular housing adapted to be mounted on a support panel, a control knob mounted within said housing for manual movement between a first position and a second position, said control knob having a portion thereof made of a light transmitting plastic material and having an enlarged outer end and an inner end, an opening centrally formed in and extending through said control knob along a longitudinal center axis thereof, a function indicator lens closing the outer end of said opening, said control knob having the outer and inner surfaces thereof provided with shielding means so as to provide a light pipe through said light transmitting plastic material so when said one of said lights is illuminated the light rays therefrom travel initially through the plastic material of the control knob along a path parallel to said longitudinal center axis after which the light rays are bent 90° and emitted from the peripheral edge and a rim portion of the outer end of said control knob, said other of said light bulbs being positioned in said control knob so that said shielding means causes the light rays emitted by said other of said light bulbs to illuminate said function indicator lens without causing any light to travel into said enlarged outer end of said control knob, and contact means operatively associated with said control knob so when the latter is moved to said first position said other of said light bulbs is illuminated and when said control knob is moved to said second position said other of said light bulbs is extinguished.

4,549,051
INDUCTION HEATING DEVICE FOR NOZZLES OF CONTAINERS

Richard A. Ness, Rte. 2, Box 280, Battle Lake, Minn. 56515

Filed Feb. 15, 1984, Ser. No. 580,343
Int. Cl.[4] H05B 6/00
U.S. Cl. 219—10.49 R 17 Claims



1. An induction heating device for an electrically conductive portion of a nozzle of a container separate from said device, said container containing a substance for ejection from said nozzle, said device comprising:

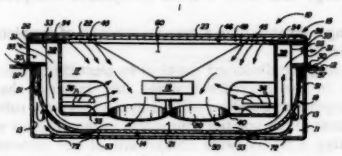
an electrical circuit including a primary inductor and a source of alternating current, said alternating current through said primary inductor creating a magnetic field; and

means for receiving said nozzle by insertion of said nozzle in an end of said primary inductor, said conductive portion of said nozzle forming a secondary inductor in which the magnetic field from said primary inductor creates an induced current in said conductive portion for dissipation therein thereby heating said conductive portion and said substance within said conductive portion of said nozzle.

4,549,052
COOLING SYSTEM FOR AN INDUCTION COOKING CARTRIDGE

Donald J. Simon, Indianapolis, Ind., assignor to The Maytag Company, Newton, Iowa

Filed Jan. 12, 1984, Ser. No. 570,288
Int. Cl.[4] H05B 6/12; F24C 15/10
U.S. Cl. 219—10.49 R 7 Claims



1. A cooking appliance for selectively receiving a modular cooking cartridge, comprising: cabinet means defining an upwardly opening recess therein; modular cooking cartridge means including enclosure means having a top, a bottom wall and side walls defining a cavity; electrical heating means in said cavity, said enclosure means further including flange means extending substantially around the periphery thereof for supporting said modular cooking cartridge in an operative posture at least partially within said recess; air inlet means including a plurality of inlet ports associated with said enclosure means top and communicating with a first airflow path defined by said recess-defining cabinet means and said cavity-defining enclosure means to conduct ambient airflow into said cavity for cooling said electrical heating means; air outlet means including an outlet opening from said cavity with said outlet opening being defined by said cavity-defining enclosure means, exhaust housing means disposed between said recess-defining cabinet means and said cavity-defining enclosure means and cooperable with said enclosure means for effectively enclosing said outlet opening and defining a second airflow path for conducting heated exhaust air from said cavity, said second airflow path being an extension of said first airflow path and separated from said first airflow path in the area of said recess by said exhaust housing means, and an outlet port through said enclosure means top above said flange means in airflow communication with said second airflow path for conducting said exhaust air to ambient; and fan means associated with said outlet opening and operable for drawing cooling air into said cavity by way of said inlet ports and said first airflow path to effect heat transfer contact with said electrical means and for exhausting the heated cooling air out through said second airflow path and said outlet port.

4,549,053

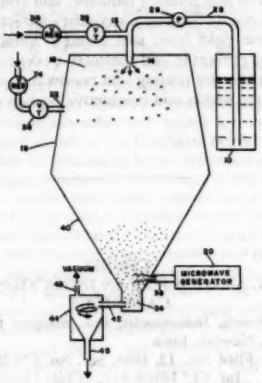
MICROWAVE DRYING DEVICE AND METHOD

Granger Haugh, 4551 Baja Mission Rd., Fallbrook, Calif. 92028

Filed Mar. 7, 1983, Ser. No. 472,485

Int. Cl.[4] H05B 6/78

U.S. Cl. 219—10.55 M 24 Claims



1. A method of drying a material containing an electromagnetic energy absorbent volatile component comprising the steps of:

forming a dispersion in a gaseous medium of droplets of the material;

subjecting the dispersed droplets to electromagnetic radiation in the microwave range, the radiation having a strength and duration sufficient to vaporize a substantial amount of the volatile component in the droplets without heating a non-volatile component of the material to a temperature which would chemically alter the non-volatile component; and

collecting the remaining non-volatile component which has not been vaporized.

4,549,054

MICROWAVE OVEN CONSTRUCTION HAVING SEPARATE COMPONENT RECEIVING CHAMBERS

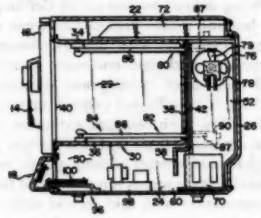
Shuki Aoyama, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1983, Ser. No. 541,912

Claims priority, application Japan, Oct. 18, 1982, 57-182535; Oct. 18, 1982, 57-182537; Oct. 18, 1982, 57-182539; Oct. 18, 1982, 57-182540

Int. Cl.[4] H05B 6/06

U.S. Cl. 219—10.55 R 11 Claims



1. A high frequency heating device comprising:

an outer case having a substantially box-like shape;

an inner case having a substantially box-like shape and which is disposed within said outer case so as to be spaced at a prescribed interval from an inner face thereof, said inner case defining a heating chamber for receiving foodstuffs to be cooked therein, and having an access opening through which said foodstuffs are put into and taken out of said inner case and a plurality of side plates opposed to respective inner faces of said outer case;

a heat shielding plate disposed between said inner and outer cases and fixed to an inner face of said outer case for dividing the space between said inner and outer cases into a first receiving chamber defined by said plate and a portion of said outer case and a second receiving chamber defined by portions of said plate, said inner case and said outer case;

electric heating means, disposed within said heating chamber, for providing heat within said heating chamber, said heating means having a heat generating portion located within said heating chamber and connecting end portions attached to said one side plate and passed through said one side plate and said heat shielding plate to protrude into said first receiving chamber;

high frequency oscillator means for radiating the high frequency energy into the heating chamber, being disposed within said first receiving chamber; and

controlling means for controlling the operations of said high frequency oscillator means and said heater means, being disposed within said second receiving chamber.

4,549,055

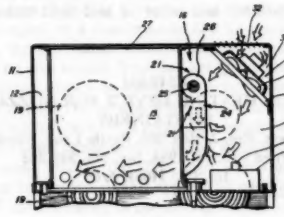
VENTILATING MEANS FOR COOKING APPARATUS

Charles F. Kohler, Oxford Township, Delaware County, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 12, 1983, Ser. No. 560,851

Int. Cl.[4] H05B 6/60; A21B 1/00; F24C 15/32

U.S. Cl. 219—10.55 R 11 Claims



1. In a cooking apparatus having cabinet means defining an oven cavity and a control space, and electrical control means in said control space for energizing the cooking apparatus, improved ventilating means comprising:

first supply means for drawing air from said control space and providing the drawn air as pressurized air to said oven cavity;

second supply means for providing pressurized air to said control space; and

discharge means for discharging the pressurized air from said oven cavity, said first and second supply means and discharge means being cooperatively arranged to maintain an above-ambient pressure at said control means.

4,549,056

ELECTROMAGNETIC INDUCTION HEATING APPARATUS CAPABLE OF HEATING NONMAGNETIC COOKING VESSELS

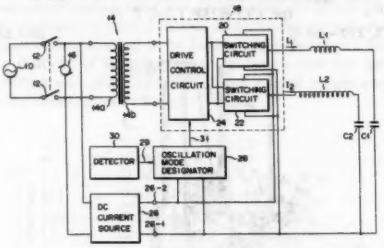
Hisashi Okatsuka, Tokyo; Koichi Taniguchi, Inuyama, and Toshio Kakizawa, Kuwana, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 9, 1983, Ser. No. 530,675

Claims priority, application Japan, Sep. 13, 1982, 57-159325; Sep. 13, 1982, 57-159327; Sep. 13, 1982, 57-159328; Sep. 13, 1982, 57-159329

Int. Cl.⁴ H05B *6/12*

U.S. Cl. 219—10.77 **12 Claims**



1. In a cooking apparatus for the induction heating of cooking utensils or vessels, comprised of solely nonmagnetic metal of at least a predetermined thickness, so as to cook food contained therein, said cooking apparatus comprising:

plate means for stably supporting one of said nonmagnetic cooking vessels; and

magnetic heating means, positioned under said plate means, for directly applying to said one vessel an alternating magnetic field with a frequency higher than 50 kHz to produce a skin effect inside said nonmagnetic-metal of said one vessel to inductively heat said one vessel, which skin effect causes the impedance for the magnetic field of said vessel to be substantially constant without regard to the thickness of said vessel, said magnetic heating means comprising a plurality of coil means stacked together for decreasing the primary impedance of said magnetic heating means while increasing the impedance of said one vessel toward that of a ferromagnetic cooking vessel, thereby improving the heating efficiency of said cooking apparatus while inductively heating said nonmagnetic-metal vessel.

4,549,057

FLUX CONCENTRATOR ASSEMBLY FOR INDUCTOR

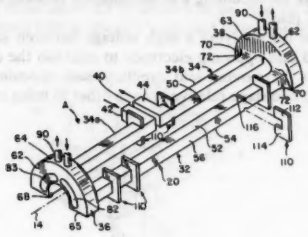
Keith Anderson, Clawson, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Oct. 24, 1984, Ser. No. 664,371

Int. Cl.⁴ H05B *6/40*

U.S. Cl. 219—10.79 **8 Claims**

1. An inductor for inductively heating a cylindrical workpiece fixedly mounted for rotation about an axis and having an exterior cylindrical surface to be heated over a predetermined axial length comprising: a conductor member fixedly mounted with respect to the workpiece connectable to a power supply and having an axial conductor section in radially spaced relation to the workpiece surface and said axis said conductor section having a length greater than the predetermined axial length to be heated; slot means formed in the conductor section transverse to said axis, the axial distance between said slot means and the location thereof on said conductor section being accurately referenced to said predetermined axial length of the workpiece surface in said heating position; keeper means carried in the slot means having mutually facing axial faces defining said predetermined length; and, flux concentrator means carried on the conductor section, said flux concentrator means having an axial length equal to said predetermined length for



establishing a uniform heating pattern over the predetermined length of the workpiece surface when the conductor member is energized by the power supply.

4,549,058

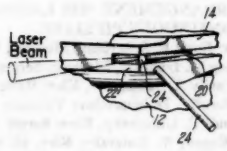
FEATHER SEAL SLOT FOR VANES

Bartolomeo P. DelMastro, Manchester, and Frederick Eckart, Southington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1983, Ser. No. 537,915

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LC **3 Claims**



1. The method of fabricating a seal between turbine vane segments forming a ring of turbine vanes of a gas turbine engine and sealing off the end of the open ended slot formed in the side face of the buttress that retains a feather seal of the turbine vane of a gas turbine engine comprising the steps of:

grinding by creep grinding a slot extending in the side face of the buttress, and

inserting a weld wire dimensioned to fit the slot adjacent the edge intended to be sealed, and

impinging high energy beam generated from a powered energy source along the edge of the weld wire adjacent the juncture where the weld wire abuts the wall of the slot to weld the weld wire to the buttress, and

sequentially cutting the weld wire at the end of the slot by the high energy beam emanating from the powered energy source so that the weld wire seals off the end of the slot at the edge.

4,549,059

WIRE BONDER WITH CONTROLLED ATMOSPHERE

Atsushi Kamijo, and Hitoshi Igarashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 555,037

Claims priority, application Japan, Nov. 24, 1982, 57-205733; Nov. 24, 1982, 57-205734; May 30, 1983, 58-95165

Int. Cl.⁴ B23K *11/22*

U.S. Cl. 219—56.21 **14 Claims**

1. A wire bonder comprising:

a capillary having a bore through which a fine metal wire runs;

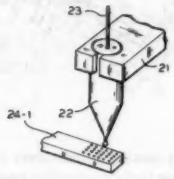
an opposing electrode for establishing a discharge between

itself and a tip of said metal wire when said capillary is above said opposing electrode;

a stage for mounting a semiconductor element and an external lead;

means for applying a high voltage between said capillary and said opposing electrode to establish the discharge;

means for moving said capillary, said opposing electrode, and said stage relative to each other to bring said capillary



above said opposing electrode, then to the surface of said semiconductor element, and finally to the surface of said external lead to connected said metal wire to said semiconductor element and said external lead; and

means for making a controlled atmospheric gas flow in a direction from said opposing electrode to said capillary and in parallel with the path of the discharge between said opposing electrode and the tip of said metal wire.

4,549,060

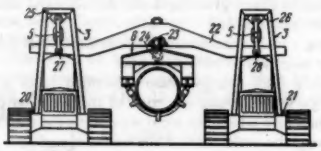
MOBILE ARRANGEMENT FOR LAYING A CONTINUOUS PIPELINE

Boris E. Paton, Kiev; Boris E. Scherbina, Moscow; Vladimir K. Lebedev, Kiev; Oleg M. Ivantsov, Moscow; Sergei I. Kuchuk-Yatsenko, Kiev; Vasily A. Sakharnov, Kiev; Boris A. Galyan, Kiev; Orest M. Serafin, Dolgoprudny; Valentin I. Krivorotenko, Kiev; Mikhail R. Unigovsky, Kiev; Sergei A. Solodovnikov, Kiev, and Evgeny V. Rulevsky, Kiev, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E. O. Patona, Kiev, U.S.S.R.

Continuation of Ser. No. 225,244, Jan. 15, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 533,162

Int. Cl.[4] B23K *11/00*

U.S. Cl. 219—59.1 **4 Claims**



1. A mobile arrangement for laying a continuous pipeline, comprising:

(a) a resistance welding apparatus adapted to be supported by walls of a pipeline and connected with a source of electric power;

(b) a pair of pipe-laying means provided on opposite sides of the pipeline being laid and in symmetrical relationship with each other, each said pipe-laying means having a jib for supporting a cross-piece located above said pipeline in a vertical plane and perpendicular to the axis thereof, each said pipe-laying means including a mobile carrier;

(c) a longitudinal support structure supported by said cross-piece and supporting a pipe carrier which extends along the axis of said pipeline;

(d) at least one suspension attached to said pipe carrier and having supporting roller for supporting said pipeline for movement in an axial direction;

(e) an outer flash trimmer mounted on the front end of said longitudinal support structure; and

(f) an inductor for thermal treatment of the weld, mounted on the rear end of said longitudinal support structure.

4,549,061

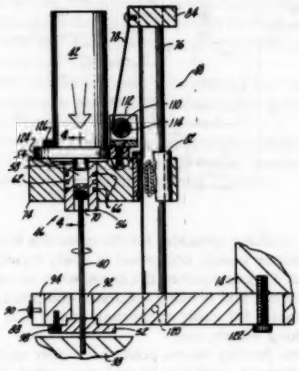
ELECTRICAL DISCHARGE MACHINING APPARATUS FOR PRODUCING THREADED HOLES

Leo P. Nicholas, 2290 Nixon, Howell, Mich. 48843, and Robert J. Nicholas, 32242 Barkley, Livonia, Mich. 48154

Continuation of Ser. No. 213,051, Dec. 15, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,373

Int. Cl.[4] B23P *1/08, 1/14*

U.S. Cl. 219—69 G **20 Claims**



1. For use with an electrical discharge machine of the type including an electrical power source, a source of dielectric fluid and an electrically conductive, elongate electrode having a threadform thereon, apparatus for machining a threaded hole at a preselected location in a workpiece, comprising:

motor means for rotating said electrode in either of two rotational directions;

means for drivingly connecting said motor means with said electrode;

means slideably mounting said motor means and said electrode for elevational movement together toward and away from said workpiece, said mounting means providing free sliding elevational movement of said motor means and said electrode toward and away from said workpiece during and throughout machining of said workpiece; and

means for guiding said electrode; during said free sliding elevational movement of said motor means and said electrode, said guiding means including a threaded aperture threadably receiving said electrode therein, the weight of said motor means normally biasing said electrode downwardly toward said workpiece and into engagement with said guiding means during and throughout machining of said workpiece.

4,549,062

LOW-POWER AVAILABILITY PROTECTION FOR ELECTRICAL MACHINING APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Kanagawaken, Japan

Filed Aug. 31, 1982, Ser. No. 413,234

Claims priority, application Japan, Sep. 3, 1981, 56-131881[U]

Int. Cl.[4] B23P *1/02*

U.S. Cl. 219—69 W **8 Claims**

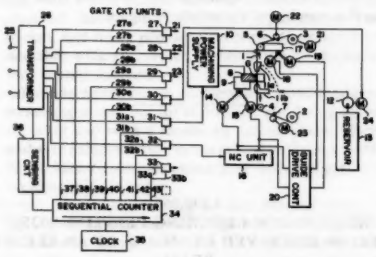
1. An apparatus for electrically shaping an electrically con-

ductive workpiece with a tool electrode in the presence of a machining fluid medium, the apparatus comprising:

a plurality of electrical output means electrically energizable from a single input source of electric power to perform their respective different operating functions including:

means for pumping said fluid medium into a gap formed between the tool electrode and the workpiece, means for passing an electrical machining current between the tool electrode and the workpiece across said fluid-filled gap to electroerosively remove material from the workpiece and means for relatively displacing the tool electrode and the workpiece to advance the material removal in the workpiece;

a like plurality of gate circuit means each connected between said single input source and a respective one of said plurality of electrical output means, said plurality of gate circuit means being adapted to be disabled in response to a failure or shut-off of electric power in said source for jointly holding said plurality of electrical output means electrically deenergized, respectively; and



a sequential trigger circuit means operable in response to a recovery of electric power in said source for sequentially producing a like plurality of trigger signals and enabling said plurality of gate circuit means therewith respectively to commence said respective output means in a predetermined sequence, said plurality of gate circuit means having a like plurality of control input terminals connected respectively with a like plurality of output terminals provided at said sequential trigger circuit means for developing said plurality of trigger signals, respectively, and are adapted to be respectively enabled thereby to commence communicating said single input source with said plurality of output means, respectively said output terminal of the sequential trigger circuit means being so connected with said gate circuit means that said means for passing the electrical machining current is enabled to communicate with said input source later than is said means for pumping the fluid medium and earlier than is said means for relatively displacing the tool electrode and the workpiece.

4,549,063

METHOD FOR PRODUCING LABELS HAVING DISCONTINUOUS SCORE LINES IN THE BACKING

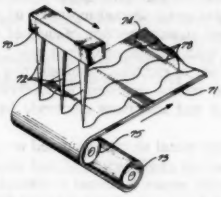
T. Liem Ang, South Pasadena; Donald Van Arnam, Ontario, and Earl McFeaters, La Crescenta, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 28,165, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 893,002, Apr. 3, 1978, abandoned. This application Jul. 20, 1983, Ser. No. 515,947

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LJ **12 Claims**

1. A method of scoring the backing of a laminate comprising a base web having a coating of a pressure-sensitive adhesive on at least one major surface thereof, said backing covering and being removably adhered to the coating of the pressure-sensitive adhesive to provide crackability and pull-across to the backing, which comprises forming on the backing at least one edge-to-edge, non-linear, discontinuous score line having a wavelength of from about 0.5 to about 6 inches and an amplitude of from about 0.03 to about 1 inch, said score line formed



of a series of scored segments of from about 0.01 to about 0.5 inch in length and a depth of at least 80 percent of the thickness of the backing, the scored segments being separated by unscored segments having a length of from about 0.005 to about 0.06 inch.

4,549,064

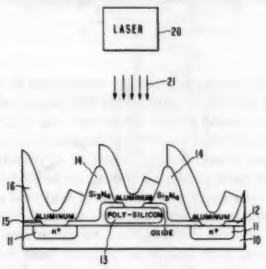
LASER TREATMENT OF SILICON NITRIDE

Michelangelo Delfino, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mt. View, Calif.

Filed Apr. 5, 1983, Ser. No. 482,122

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LM **13 Claims**



1. The method of inducing annealing, flow or densification in a silicon nitride portion of a semiconductor device structure covered at least partly by other portions of said device made of other non-silicon nitride materials, wherein annealing, flow or densification is induced on said silicon nitride portion upon application of heat thereto, comprising applying a laser beam to said silicon nitride portion wherein said laser beam is an ArF excimer laser beam having an emission wavelength which is approximately equal to the wavelength most absorbed by the silicon nitride portion and not of a wavelength most absorbed by said other portions.

4,549,065

PLASMA GENERATOR AND METHOD

Salvador L. Camacho, and David P. Camacho, both of Raleigh, N.C., assignors to Technology Application Services Corporation, Raleigh, N.C.

Filed Jan. 21, 1983, Ser. No. 460,062

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PM **15 Claims**

1. A plasma arc torch comprising

a rear electrode comprising a tubular metal member having a closed inner end and an open outer end,

a front electrode comprising a tubular metal member having a bore therethrough, said front electrode being mounted in coaxial alignment with and electrically insulated from said

rear electrode and having an inner end adjacent said open outer end of said rear electrode and an opposite outer end,

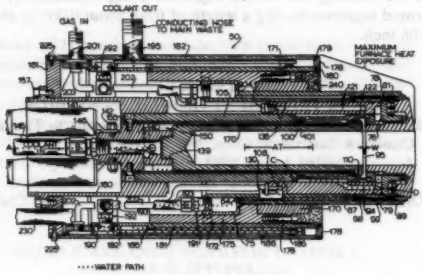
vortex generating means including a vortex forming chamber disposed intermediate and in coaxial alignment with said rear and front electrodes for generating a vortical flow of a gas between said rear and front electrodes,

an inner annular metal shroud mounted to concentrically surround at least an axial portion of each of said rear and front electrodes, with said inner shroud being connected to said front electrode in electrically conductive relationship,

first insulation means mounted to electrically insulate said inner shroud and said front electrode from said rear electrode,

an outer annular metal shroud mounted to concentrically surround at least an axial portion of said rear electrode,

second insulation means mounted to electrically insulate said outer shroud from each of said rear and front electrodes and said inner shroud,



power supply means operatively connected to said rear electrode and said outer shroud for generating an arc which is adapted to extend axially from said rear electrode through said vortical flow of gas and through at least a portion of the axial length of said bore of said first electrode, and

coolant flow path means extending so as to be in serial heat exchange relationship with each of said rear electrode, said front electrode, said inner shroud, and said outer shroud, and such that a fluid coolant may be circulated through said coolant flow path means to remove heat from said torch during operation thereof, said coolant flow path means including a first segment which extends through said first insulation means and between said rear and front electrodes, and a second segment which extends through said second insulation means and between said inner and outer shrouds, said first and second segments each having a length such that said first and second insulation means each provide a predetermined electrical resistance in the portions of the coolant flow path means extending therethrough to effectively avoid short circuiting through the coolant.

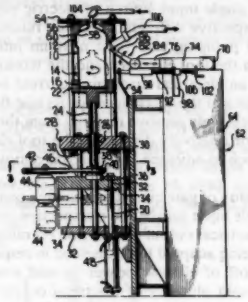
4,549,066

TRIMMING OF POLYESTER CONTAINERS USING A LASER

David P. Piccioli, Milford; Ieuan L. Harry, Nashua, and Richard E. Clark, Merrimack, all of N.H., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Filed Feb. 24, 1984, Ser. No. 583,543
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LG **8 Claims**

1. A cut-off apparatus for trimming a hollow plastic article, said cut-off apparatus comprising holder means for supporting and rotating a plastic article about a selected axis at a selected position along said axis, and laser means for directing a laser beam toward a selected portion of a hollow plastic article carried by said holder means during the rotation of said hollow plastic article to simultaneously cut said hollow plastic article and to form a resultant cut edge of said hollow plastic article, and means for introducing a gas under pressure into said hollow article during the use of the laser beam to cut the hollow



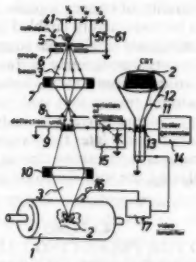
plastic article to direct fusion matter resulting from laser cutting to the exterior of the article being cut.

4,549,067

METHOD FOR CHECKING PRINTING FORM SURFACES ENGRAVED BY MEANS OF AN ELECTRON BEAM

Siegfried Beisswenger, and Wolfgang Boppel, both of Preetz, Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,518
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240653
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EK **4 Claims**



1. A method for engraving and then checking cups in a printing form surface, comprising the steps of:

engraving the cups by means of an electron beam of an electron beam generator wherein the electron beam forms cup-like depressions in a surface of the printing form;

operating the same electron beam generator as a scanning electron microscope for checking a shape of the cups by scanning a region thereof to be imaged, the electron beam being switched to a microscope mode with respect to its deflection parameters and its intensity; and

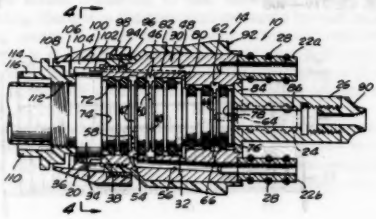
acquiring a video signal for drive of a monitor from secondary electrons generated by the beam intersecting with the cups in the printing form surface.

4,549,068

WELDING TORCH HAVING SWIVEL HEAD ASSEMBLY

Milo M. Kensrue, 49-320 Sunrose La., Palm Desert, Calif. 92260

Filed Dec. 9, 1983, Ser. No. 559,985
Int. Cl.[4] B23K 9/32
U.S. Cl. 219—137.63 13 Claims



1. A welding torch structure, comprising:

a main base barrel adapter structure of electrical conducting material having a cylindrical open-ended receiving socket, and being provided with means respectively connectable with gas, water, welding wire and electric current supply sources;

an elongate torch barrel of electrical conducting material mounting a welding tip at one end and being provided at its other end with a mounting end structure adapted for endwise axial insertion into a seated position in said socket to establish operative connections with said gas, water and welding wire sources;

electric current conducting flexible contact means carried by said main base barrel adapter structure positioned to frictionally engage a surface portion of the seated barrel mounting end structure in a manner permitting relative movements between the main base adapter structure and the seated barrel mounting end structure; and

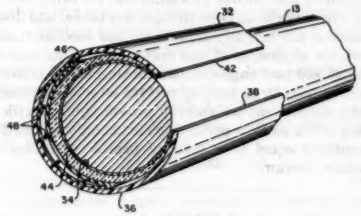
manually operable means carried by said main base adapter structure for actuating the contact means into gripping engagement with said surface portion to hold said contact means and said surface portion against relative movement and to establish an operative electric connection with said electric current supply source.

4,549,069

ELECTRICALLY HEATED STEERING WHEEL COVER

Eray Oge, Clamshell La., Northport, N.Y. 11768

Filed May 14, 1984, Ser. No. 610,197
Int. Cl.[4] H05B 3/52, 1/02; B62D 1/06
U.S. Cl. 219—204 3 Claims



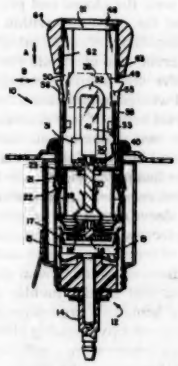
1. An electrically heated cover for a steering wheel having a rim, a horn switch and a horn cover, comprising an annularly extending cylindrical sleeve parted along a line on said sleeve facing and parallel to the rim of the steering wheel thereby permitting said sleeve to be readily mounted on and partially enclose the rim, said sleeve being comprised of inner and outer sparated covers which are joined where said sleeve is parted, said sleeve containing an array of electrically energized heating elements between said covers arranged in parallel and embedded in a layer of thermally conductive, electrically insulating material, thermal insulation disposed between said heating elements and said inner cover which is adapted to contact the rim when said sleeve is mounted on the rim, means for supplying electrical current through the circuitry of the horn switch to said heating elements to heat said sleeve, said thermal insulation inhibiting the flow of heat into said steering wheel, and an illuminated switch adapted to be mounted on the horn cover to energize said heated cover.

4,549,070

COMBINED CIGARETTE AND CHART/MAP LIGHTER

Jiann-Yu Huang, Gloversville, N.Y., assignor to N. A. Taylor Company, Inc., Gloversville, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,739
Int. Cl.[4] F23Q 7/22
U.S. Cl. 219—269 20 Claims



1. A device for providing a source of heat for the heating of a cigarette or the like, or for providing a source of illumination, for use in combination with a stationary socket operatively connected to a source of electrical energy, said device comprising:

a plug body elongated in a first dimension;

an igniter coil and cup mounted at a first end of said plug body;

a light bulb receiving socket mounted in a central portion of said plug body;

means defining an opening in said plug body adjacent said light bulb socket so that light from a bulb in the socket may shine out said opening to illuminate an area adjacent thereto;

a cap removably mounted to the second end of said plug body, opposite said first end thereof; and

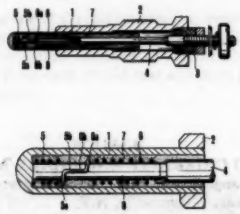
a reciprocal element, reciprocal in said first dimension, mounted within said plug body between said light bulb socket and said removable cap, said reciprocal element guided for reciprocal movement within said cap and body and comprising means for providing illumination of a light bulb received within said light bulb socket, when in a first position thereof, or for providing electric resistance heating of said igniter coil when in a second position thereof.

4,549,071

GLOW PLUG FOR USE IN DIESEL ENGINE

Koji Hatanaka, and Tozo Takizawa, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 372,311, Apr. 27, 1982, Pat. No. 4,476,378. This application Sep. 23, 1983, Ser. No. 535,301
Claims priority, application Japan, Sep. 28, 1982, 57-168738
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.
Int. Cl.⁴ F23Q 7/22
U.S. Cl. 219—270 1 Claim



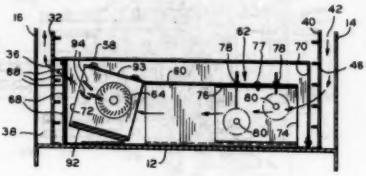
1. A glow plug comprising a tubular casing having open ends provided wibh an external thread, an elongate tubular sleeve closed at one end and open at the other disposed in the tubular casing with the closed end protruding from one open end thereof and the open end within the tubular casing, an electrode rod disposed within the other open end of the casing and secured therein, said electrode rod extending axially into the tubular sleeve into abutting engagement with the closed end thereof and welded to said closed end of the tubular sleeve, said electrode rod being of two diameters and defining at the junction of the two diameters an annular shoulder located approximately mid-length of the tubular sleeve, a first electrically-conductive heating element in the form of a coil of predetermined positive resistance temperature coefficient disposed in the tubular sleeve about the electrode rod in concentric relation to the electrode rod and the tubular sleeve comprised of a helical coil of wire of open pitch and uniform diameter less than the inside diameter of the tubular sleeve, one end of which abuts the closed end of the tubular sleeve and is welded thereto, said coil being of a predetermined axial length, a second electrically-conductive heating element of predetermined positive resistance temperature coefficient higher than the first heating element disposed in the tubular sleeve about the electrode rod in concentric relation thereto and the tubular sleeve and axially spaced from the first heating element such that there is a gap between the adjacent ends of the heating elements, said heating elements collectively being of lesser axial length than the distance between the closed end of the tubular sleeve and the shoulder and said second heating element comprising a helical coil of wire of open pitch and uniform diameter corresponding in pitch and diameter to the first heating element and of an axial length greater than the axial length of the first coil with its distal end engaged with the shoulder and secured thereto and means connecting the coils at their adjacent ends comprising straight lengths of wire extending from the adjacent ends parallel to the longitudinal axis of the coils bridging the gap between the adjacent ends and welded to each other, an electrically-insulated, thermally-conductive particulate material filling the sleeve about the electrode rod and the spaces between the helices of the heating coils throughout the length of the tubular sleeve, characterized in that the gap between adjacent ends of the heating elements is of a length of 1.5 to 12 times the pitch of the helices of the coil of the first heating element, the ratio of the length of the first heating element to the diameter of the sleeve is less than 1.5, the resistance ratio at normal temperature of the first and second heating elements is 2.5 to 7.0 and the second heating element is comprised of nickel or low carbon steel.

4,549,072

PROOFING OR HEATING CABINET

Kenneth Brist, and Robert D. Klein, both of Fort Wayne, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Jan. 3, 1983, Ser. No. 455,001
Int. Cl.⁴ F27D 11/00; F24H 3/04; H05B 1/00
U.S. Cl. 219—400 8 Claims



1. A proofing cabinet, comprising:

an enclosure having an interior, a pair of oppositely disposed side walls and a pair of oppositely disposed interior walls, said side walls and interior walls forming a plurality of vertically elongate heat ducts therebetween, said heat ducts communicating with said interior through openings in their mutually facing surfaces and having respective aligned duct openings in said mutually facing surfaces,

a modular heating tunnel being removably disposed in said enclosure and having aligned end openings communicating with respective ones of said heat ducts through their respective said duct openings, said end openings and said duct openings being aligned with each other, said duct openings decreasing along the length of said heat ducts in a direction away from said tunnel,

electric heating element means in said modular heating tunnel at one of said end openings, said electric heating element means substantially extending across the width of said one end opening and presenting a large heating surface area therein, and

blower means in said modular heating tunnel at the other said end opening and substantially extending across the width of said other end opening for uniformly drawing air from said interior through one of said heat ducts into said modular heating tunnel and across said electric heating element means to be heated thereby, and uniformly urging the flow of heated air through said modular heating tunnel into and through the other said heat duct and horizontally across said interior, said blower means secured to an angled support member connected to said tunnel for angling said blower means upwardly to direct said heated flow of air urged by said blower upwardly into the other said heat duct, whereby the air flow though said tunnel and ducts is maintained substantially laminar by said modular heating tunnel, the alignment of said end openings and said duct openings and said angled blower means, and is uniformly heated by said large heating surface area of said electric heating element means, thereby providing more efficient heating of the air flow per unit of heat energy supplied and substantially equal flow rates of heated air across said enclosure interior.

4,549,073

CURRENT CONTROLLER FOR RESISTIVE HEATING ELEMENT

Paul S. Tamura, Palo Alto, and Robert J. Strehlow, Mountain View, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Filed Nov. 6, 1981, Ser. No. 319,101
Int. Cl.⁴ H05B 1/02
U.S. Cl. 219—497 15 Claims

1. Apparatus for controlling the flow of heating current

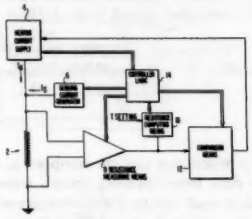
through a resistive element in order to heat the resistive element from ambient temperature to a desired temperature, said apparatus comprising:

heating current supply means for supplying the resistive element with heating current;

measuring means for measuring the resistance of the resistive element;

detection means connected to said measuring means for detecting changes in the resistance measured by said measuring means in order to determine when the resistive element is at ambient temperature, said detection means including detection circuit means for generating a first logic signal indicative of ambient temperature conditions in the resistive element;

computing means connected to said measuring means and said detection means for computing the predicted resistance of the resistive element at the desired temperature, said computing means including a first computing circuit



means responsive to said first logic signal for receiving the value of said resistance measured by said measuring means when the resistive element is at ambient temperature, said computing means also including a second computing circuit means for computing said predicted resistance as a function of the desired temperature and said value of said resistance received by said first computing circuit means; and

comparison means connected to both said measuring means and said computing means for comparing said predicted resistance with said resistance measured by said measuring means, said comparison means including a control signal means for generating a control signal as a function of the difference between said predicted resistance and said resistance measured by said measuring means, said comparison means also including a control circuit means connected to said control signal means for conducting heating current through the resistive element in response to said control signal.

4,549,074

TEMPERATURE CONTROLLER FOR PROVIDING A RAPID INITIAL HEATING CYCLE USING A VARIABLE REFERENCE VOLTAGE

Katsuharu Matsuo, 1-10-20, Jiryo, Nishibiwajima-cho, Nishikasugai-gun, Aichi-ken, Japan

Filed Jul. 13, 1983, Ser. No. 513,289

Claims priority, application Japan, Jul. 16, 1982, 57-124794; Jul. 27, 1982, 57-130854

Int. Cl.⁴ H05B *1/02*

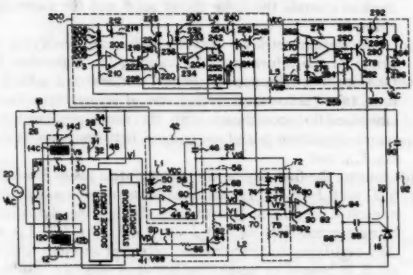
U.S. Cl. 219—505 **14 Claims**

1. A temperature control apparatus suitably applied to flat heating equipment which includes a flat heat-retaining member such as a blanket, a heater wire disposed inside said heat-retaining member, and a sensor wire arranged inside said heat-retaining member to generate heater temperature data corresponding to a temperature of said heater wire, said temperature control apparatus comprising:

(a) first circuit means for selectively generating first data representing a first temperature corresponding to a desired target temperature of said heat-retaining member and second data representing a second temperature which is higher than the first temperature by a constant degree independently of the desired target temperature of said heat-retaining member;

(b) second circuit means, connected to said sensor wire, for generating a temperature detection signal having a signal level corresponding to the heater temperature data;

(c) third circuit means, connected to said first and second circuit means, for comparing the detection signal with one of the first and second data as reference temperature data, and for preventing power supply to said heater wire when the signal level of the temperature detection signal exceeds a level of the reference temperature data; and



(d) fourth circuit means, connected to said first and second circuit means, for controlling said first circuit means so as to generate the second data in an initial period after said flat heating equipment becomes operative and to continuously generate the first data after said signal level of the detection signal has reached a level corresponding to the second temperature, said fourth circuit means automatically generating the first data in the initial period when the heater temperature data is higher than said desired target temperature of said heat-retaining member.

4,549,075

METHOD FOR CERTIFYING THE ORIGIN OF AT LEAST ONE ITEM OF INFORMATION STORED IN THE MEMORY OF A FIRST ELECTRONIC DEVICE AND TRANSMITTED TO A SECOND ELECTRONIC DEVICE, AND SYSTEM FOR CARRYING OUT THE METHOD

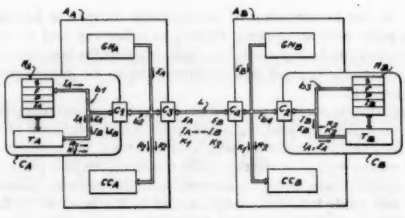
Charles Saada, Saint Cloud, and Jean Mollier, Bougival, both of France, assignors to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 20, 1983, Ser. No. 505,975

Claims priority, application France, Jul. 8, 1982, 82 12021

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 235—380 **7 Claims**



1. A method for certifying the origin of at least one item of information I_A stored in the memory of a first electronic device C_A controlled by an individual A, said information I_A being specific to individual A_M and being transmitted for certifica-

tion to a second electronic device C_B controlled by an individual B, said individual B being assigned at least one specific item of information I_B which was previously stored into the memory M_B of the second electronic device C_B, comprising the steps of:

(a) causing to be calculated within each device C_A, C_B a result R calculated by the same predetermined secret algorithm f and taking account of the same predetermined secret set S and the same random number E_B supplied by the second electronic device C_B, and

(b) comparing within the second device C_B, the two results R, the agreement between said two results R certifying to individual B that the first device C_A belongs to the same group as his device C_B owing to the fact that the two devices contain the same secret set S and the same algorithm f;

(c) information retrieval service individual certifying the origin of the information I_A, causing the algorithm f to take account of a supplementary parameter J which, in turn, takes account of both items of information I_A, I_B, combined in accordance with the same predetermined secret algorithm p and exchanged between two devices C_A, C_B, and

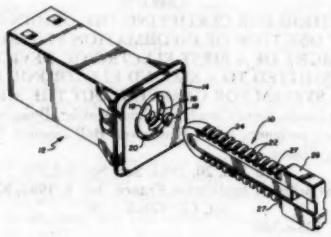
(d) causing the first device C_A to calculate a result $R=f(E_B, S, J)$ with $J=p(I_A, I_B)$ and the second device to calculate a result $R=f(E_B, S, J)$ with $J=p(I_B, I_A)$, the algorithm p being symmetrical so that $J=p(I_A, I_B)=p(I_B, I_A)$ and thus certifying to (information retrieval service) individual B, in case of an agreement between said two results R, that the information I_A has not been altered during its transfer from the first electronic device C_A, and that it comes solely from said first device C_A.

4,549,076

ORIENTATION GUIDE ARRANGEMENT FOR ELECTRONIC KEY AND RECEPTACLE COMBINATION

William P. Flies, Burnsville, Minn., assignor to Datakey, Inc., Minneapolis, Minn.

Filed Mar. 24, 1983, Ser. No. 478,221
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—382 **6 Claims**



1. In the combination of an electrical receptacle having a face plate with an opening leading to a keyway and an electronic key, including a head portion, adapted for insertion into the receptacle keyway and rotation therein, the improvement comprising:

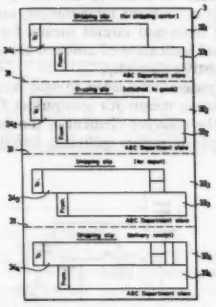
registration means operative between the key and receptacle face plate for assuring a predetermined orientation of the key relative to the keyway upon insertion, the registration means including arcuate guide means on the face plate, the guide means being concentric with the keyway opening, and guide follower means carried by the head of the key, the guide follower means being disposed on the head and projecting therefrom so as to register with the arcuate guide means allowing full insertion of the key into the receptacle when the key is oriented in a predetermined manner relative to the keyway and guiding the key during rotation.

4,549,077

SLIP PROCESSING SYSTEM

Kiroyuki Kataoka, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,395
Claims priority, application Japan, Oct. 30, 1981, 56-172889
Int. Cl.[4] G07B *15/02*
U.S. Cl. 235—384 **10 Claims**



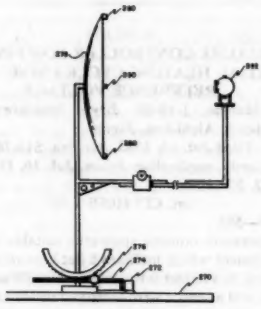
1. A slip processing system, comprising; means for reading necessary data from separate sheets, means for identifying, from the data read, certain letters or numerals that characterize a slip to be prepared, means for selecting a predetermined visual mark according to the results of said identification, means for storing the image of the data read, editing means for allocating the stored data and selected mark into locations on predetermined slip forms, and means for printing the edited data onto a prescribed slip sheet.

4,549,078

AUTOMATIC TRACKING SYSTEM WITH INFRARED AND ULTRAVIOLET DETECTION

Daniel E. Monahan, 2200 Woodlawn St., Kannapolis, N.C. 28081

Continuation-in-part of Ser. No. 348,691, Feb. 16, 1982, abandoned, which is a division of Ser. No. 178,513, Aug. 15, 1980, Pat. No. 4,318,890, which is a division of Ser. No. 948,061, Oct. 2, 1978, Pat. No. 4,233,127. This application Oct. 18, 1983, Ser. No. 542,932
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—203 R **4 Claims**



1. An automatic tracking system for tracking the sun on a path across the sky, comprising:

a reflector;

a pre-programmed, automatic timed drive mechanism connected to said reflector for driving said reflector on a

given path, both ultraviolet and infrared sensors positioned on said reflector;

means for comparing the amount of light detected by each opposing pair of sensors; and

means responsive to said comparing means for tilting the reflector about a horizontal and a vertical axis until the amount of light detected by each pair of sensors is equalized.

4,549,079

APPARATUS FOR MEASURING THICKNESS OF PAINT COATING

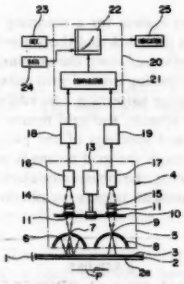
Yoshiyasu Terasaka, Ibaraki; Masao Tanabe, Osaka, and Masanori Hori, Ibaraki, all of Japan, assignors to Chugai Ro Kogyo Co., Ltd., Japan

Filed Dec. 28, 1982, Ser. No. 453,935

Claims priority, application Japan, Dec. 29, 1981, 56-212029

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—339 **12 Claims**



1. Apparatus for measuring thickness of a paint coating formed on a substrate, which comprises a black-body radiator for continuously emitting constant infrared rays to the paint coating on the substrate to be continuously conveyed in one direction; at least one band-pass filter for admitting infrared rays having predetermined wave length range to pass therethrough, said infrared rays including infrared rays emitted from the black-body radiator and reflected at a surface of the substrate through said paint coating and infrared rays radiated due to temperature of both of the paint coating and the substrate; infrared rays detecting sensors, one of which detects intensity of said reflected infrared rays from the substrate to convert the reflected infrared rays to corresponding electric signals, and the other of which detects intensity of the infrared rays radiated due to temperature of both of the paint coating and the substrate to convert the infrared rays to corresponding electric signals; a reference signal source in which various premeasured reference coefficients of infrared ray absorption with respect to various thicknesses of the paint coating and various premeasured reference reflection coefficients with respect to various kinds of reflection surfaces of different substrates are memorized and signals representing these reference coefficients are produced and a processing unit in which the signals from said infrared radiation detecting sensors are compared with each other, and signals representing only the intensity of the reflected infrared rays from the substrate are produced as signals representing the thickness of the paint coating after being processed on the basis of said reference coefficients supplied from said reference signal source.

4,549,080

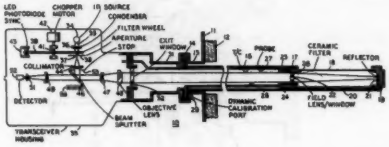
DOUBLE-PASS FLUE GAS ANALYZER

Lowell L. Baskins, Santa Barbara; James M. Keene, Ojai, and John G. Montfort, Santa Barbara, all of Calif., assignors to Infrared Industries, Inc., Santa Barbara, Calif.

Filed Jun. 17, 1983, Ser. No. 505,387

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—343 **8 Claims**



1. Apparatus for measuring the concentration of each gas in a mixture in a common sample chamber of H_2O, CO_2, and CO wherein infrared radiation is passed through the sample chamber along a path to impinge upon an infrared detector comprising:

(a) filters for transmitting a limited band of frequencies in individual absorption bands, one filter for each of H_2O, CO_2, and CO:

(b) means for successively projecting the filters into the path;

(c) and means for measuring the output of the detector as each filter is projected into the path;

whereby the detector output is a measure of the amount of absorption of the individual gases and therefore a measure of the concentration, characterized by the CO_2 filter passing a band of frequencies in the absorption curve of the C^{13} isotope to thereby approximate the absorption by CO.

4,549,081

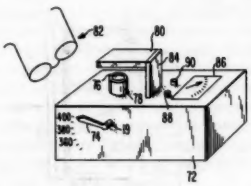
SPECTROPHOTOMETER FOR MEASURING ABSORPTION CHARACTERISTICS OF A COMPLEX LENS

Ronald Ace, Lanham, Md., assignor to Ace Sophisticates, Inc., Lanham, Md.

Filed Mar. 15, 1984, Ser. No. 589,801

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—372 **23 Claims**



1. A method for measuring the absorption characteristics of a lens to light waves of a selected band of wavelengths, comprising the steps of:

directing light having at least wavelengths from a selected band of wavelengths through a filter which passes only said selected band of wavelengths;

directing the filtered light through a lens to be tested;

sensing the amount of light which passes through a lens to be tested with an integrating light detector that is placed in close proximity to a lens to be tested so as to be able to detect substantially all of the light passing therethrough; and

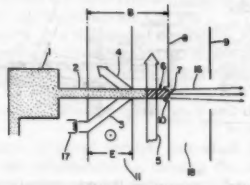
utilizing the signal generated by said integrating light detector to provide an output.

4,549,082

SYNTHETIC PLASMA ION SOURCE

Michael R. McMillan, 1905 Cathy La., #203, McLean, Va. 22102

Filed Apr. 19, 1983, Ser. No. 486,526
Int. Cl.[4] H01J *27/00*
U.S. Cl. 250—423 R 28 Claims



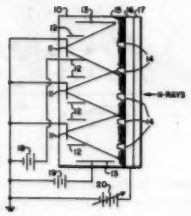
1. An ion beam source comprising:
means for forming a collimated molecular beam of gas atoms;
means for generating low-energy electrons and adding them to the collimated molecular beam;
means for forming a primary beam of ions of a species of atoms having an ionization potential similar in value to the particles in said molecular beam and projecting said primary ion beam through said molecular beam in a region of ionization to form a substantially undeflected secondary ion beam;
a synthetic plasma being formed thereby in the region of ionization and downstream thereof; and
electrode means for forming an electrostatic field for extracting secondary ions from the downstream edge of the plasma.

4,549,083

X-RAY IMAGING DEVICE FOR DIRECTLY DISPLAYING X-RAY IMAGES

Lyuji Ozawa, Glencoe, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1983, Ser. No. 496,627
Claims priority, application Japan, Jun. 10, 1982, 57-100239; Jun. 10, 1982, 57-100240
Int. Cl.[4] G21K *4/00*; H01J *31/50*
U.S. Cl. 250—458.1 20 Claims



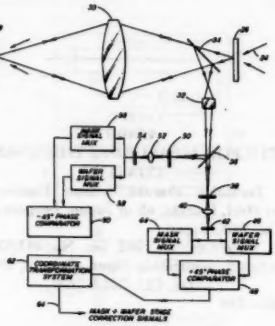
1. An X-ray imaging device for directly displaying X-ray images on a screen, comprising:
a layer of phosphor crystals arranged on said screen;
at least one cathode for emitting electrons which impinge on said phosphor screen, said crystals being excited by said electrons so as to display said X-ray image by a steady cathodoluminescence;
wherein said phosphor crystal excitation is controlled by the persistent polarization and depolarization thereof, said crystals emitting said steady cathodoluminescence only when depolarized and said crystals comprising a material which is depolarized when X-rays irradiate said persistently polarized crystals.

4,549,084

ALIGNMENT AND FOCUSING SYSTEM FOR A SCANNING MASK ALIGNER

David A. Markle, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 21, 1982, Ser. No. 451,900
Int. Cl.[4] G01H *21/86*
U.S. Cl. 250—548 18 Claims



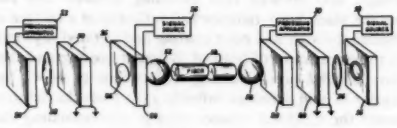
1. In an alignment-system for a scanning mask aligner employing a pattern on the mask and the wafer in the scribe lines that run in the direction of scan, the combination comprising:
a viewing system having optical grid means;
means for moving the patterns across said optical grid means in the viewing system, the grid means corresponding to the directions and spacings of the patterns so that light transmitted through the grid means is modulated; and
means for comparing the phase modulation from the mask and wafer alignment targets to obtain alignment error signals.

4,549,085

ELECTRO-OPTICAL SIGNAL PROCESSING SYSTEMS AND DEVICES

Thaddeus R. Ulijasz, Geneva, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 14, 1983, Ser. No. 484,930
Int. Cl.[4] G02B *27/00*
U.S. Cl. 250—551 13 Claims



1. Apparatus for processing multiple signals having significantly different wavelengths utilizing a light propagating medium having two ends comprising:
an inner diode emitter optically coupled to one end of said medium and an inner diode detector optically coupled to the other end of said medium, said inner imitter and inner detector being capable of processing a relatively short wavelength optical signal through said medium, and
an outer diode emitter optically coupled to one end of said medium and an outer diode detector optically coupled to the other end of said medium, said outer emitter and outer detector being capable of processing a relatively long wavelength optical signal through said inner emitter and inner detector and through said medium,
the one of said inner diode emitter and said inner diode

detector which is optically coupled to the same end of said medium as said outer diode emitter being optially closer to said medium than said outer diode emitter and coaxial with said outer diode emitter, the other one of said inner diode emitter and said inner diode detector which is optically coupled to the same end of said medium as said outer diode detector being optically closer to said medium than said outer diode detector and coaxial with said outer diode detector,

said inner emitter and inner detector having a bandgap wavelength which is less than the wavelength of said long wavelength signal, whereby said inner emitter and inner detector are substantially electro-optically transparent to said long wavelength signal, each of the emitters and each of said detectors having a separate substrate.

4,549,086

OPTICAL-ELECTRONIC MONITORING APPARATUS

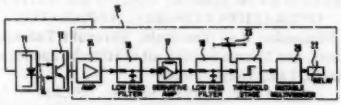
Gerhard Herzer, Emmendingen, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,111

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133494

Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—561 **20 Claims**



1. Apparatus for monitoring undesired material buildup along the surface of a rotating object, the object having first and second ends through which an axis of rotation passes, the apparatus comprising:

a radiant energy transmitter positioned at the first end of the object to direct a beam of radiant energy parallel to the object surface with a portion of the radiant energy beam being obscured by the object;

a radiant energy receiver at the second end of the object positioned to receive at least a portion of the radiant energy beam; and

an electrical evaluation circuit means, coupled to the radiant energy receiver, for providing an indication of material buildup along the object surface, the circuit means including in series a first low pass filter following the radiant energy receiver, a derivative stage for producing a first signal according to the change in radiant energy, received by the radiant energy receiver, with respect to time, and a second low pass filter for producing a second signal.

4,549,087

LEAD SENSING SYSTEM

Robert J. Duncen, Magnolia; Richard B. Maxner, Danvers; Jean A. McLean, South Hamilton, and William H. Mirley, Jr., North Reading, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 27, 1982, Ser. No. 451,921

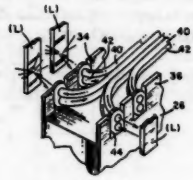
Int. Cl.⁴ G01H *21/86*

U.S. Cl. 250—561 **14 Claims**

1. In a component insertion machine wherein the leads of components are inserted through holes in a medium after the medium has been positioned for receipt of the leads through the holes, a system for determining whether the leads are properly inserted through the holes in the medium, said system comprising:

a plurality of optical sensors, located below the positioned medium, each optical sensor individually sensing the presence or absence of only one respective lead of the component extending beneath the medium;

means for reading the status of each of said plurality of optical sensors after the component leads have been inserted into the holes in the positioned medium; and



means for verifying that the status of each optical sensor is in accordance with a predetermined status for that particular optical sensor.

4,549,088

ORIGINAL READING DEVICE

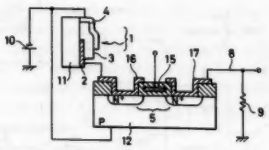
Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 459,022

Claims priority, application Japan, Jan. 29, 1982, 57-13123

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **10 Claims**



1. In an image sensor including a photoelectric transducer, a biasing voltage source coupled to said photoelectric transducer, and an n-channel MOS transistor formed on a semiconductor substrate with a first terminal of said photoelectric transducer being connected to a drain of said MOS transistor, a capacitor and a diode being formed between said drain and said substrate of said MOS transistor, said MOS transistor being turned on to connect said capacitor to a load connected between a source of said MOS transistor and a ground terminal for detecting an intensity of light from an amount of charge stored on said capacitor, the improvement comprising means for maintaining said substrate during charging of said capacitor at a potential equal to or lower than a negative value of the potential of said biasing voltage source.

4,549,089

ENGINE CRANKING MOTOR LOCK OUT SYSTEM

Earl H. Buetemeister, Alexandria, and Larry L. Colville, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

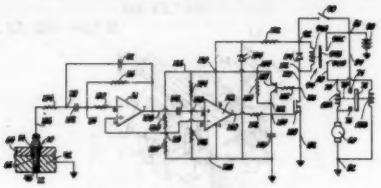
Filed Feb. 21, 1984, Ser. No. 581,916

Int. Cl.⁴ F02N *11/08*

U.S. Cl. 290—38 R **7 Claims**

1. Apparatus for developing an electrical signal in response to a running condition of an internal combustion engine comprising in combination, an internal combustion engine having a housing, a cranking motor for cranking said engine having a mounting housing portion engaging a portion of said engine housing, at least one bolt having a head portion engaging said cranking motor housing portion and having a threaded portion

threaded into a threaded opening in said engine housing for securing said cranking motor to said engine, said head portion of said bolt carrying a transducer that is operative to translate mechanical movement of the head portion into an electrical



signal, said head portion of said bolt being mechanically moved by oscillatory motion of said cranking motor caused by a running condition of said engine to thereby cause said transducer to produce an electrical signal.

4,549,090

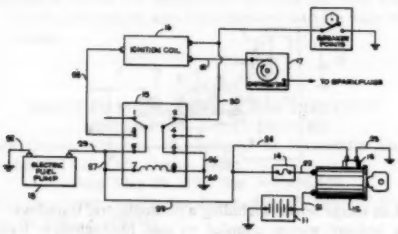
DEVICE FOR PREVENTING THEFT OF MOTOR VEHICLES

William A. Read, 35803 Argonne St., Newark, Calif. 94560

Division of Ser. No. 246,853, Mar. 23, 1981, Pat. No. 4,449,605. This application Apr. 26, 1984, Ser. No. 604,222

Int. Cl.⁴ B60R *25/04*

U.S. Cl. 307—10 AT **4 Claims**



1. An anti-theft circuit for a key-operated electrical system in a moror vehicle, said system having a power source and an electrical circuit connected between the electric load in the system and the power source, and further having a key cylinder switch in said circuit which is operated by insertion of a key into a rotatable key cylinder and rotation of said key cylinder in its housing support, such that said key cylinder switch connects the electrical power source to the electric load of the system, comprising:

switching means actuatable by the removal of the key cylinder from said system;

fuse means in the electrical circuit of said system; and

circuit means connecting said switching means to said fuse means, such that said electric load is connected to ground upon removal of said key cylinder and said power source is disconnected by said fuse means upon subsequent connection of the key cylinder switch contacts.

4,549,091

ELECTRICAL EXCITATION CIRCUIT FOR GAS LASERS

Theodore S. Fahlen, and Barton Mass, both of San Jose, Calif., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 8, 1983, Ser. No. 521,054

Int. Cl.⁴ G11C *13/02;* **H01J** *3/10*

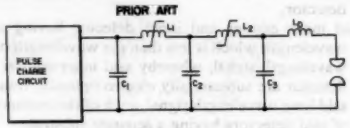
U.S. Cl. 307—106 **29 Claims**

1. An electrical excitation circuit for a gas laser connectable between a power source and a laser load comprising:

charging circuit means connected to the power source; and

a pulse forming network connected to the charging circuit means and the laser load, the pulse forming network comprising:

(a) a saturable inductor switch alternatively having an unsaturated state and a saturated state, the saturable inductor switch being shunted across the charging circuit means; and



(b) at least one capacitor shunted across the saturable inductor switch and connected to the laser load, the at least one capacitor being charged by the charging circuit means when the saturable inductor switch is in the unsaturated state and being discharged through the laser load when the saturable inductor switch transposes to the saturated state.

4,549,092

CONTROL SYSTEM FOR ILLUMINATION LAMP INSTALLED IN BUILDING EQUIPPED WITH DOOR OPERATION CONTROL APPARATUS

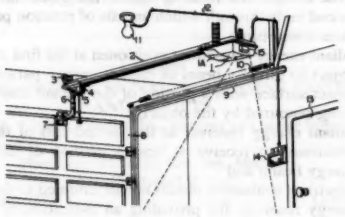
Shigeru Matsuoka; Koji Yamauchi; Hiroyuki Tadokoro; Seiji Yonekura, and Mitsuo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,108

Claims priority, application Japan, Mar. 10, 1981, 56-33079

Int. Cl.⁴ H01H *35/00;* **E05F** *15/20*

U.S. Cl. 307—116 **21 Claims**



6. A control system for controlling the operation of an illumination lamp installed in a building equipped with a door and a door operation control apparatus, comprising

an illumination lamp for illumination of the interior of the building;

door opening and closing instruction means for generating an open and close instruction signal instructing the opening and closing of the door of the building;

control circuit means responsive to said open and close instruction signal for producing a door control signal for controlling the opening and closing of the door and a lamp control signal for turning on said illumination lamp for a period of time;

drive means for effecting opening and closing drive of said door in response to aid door control signal;

detector means for detecting positional changes of a body within said building and for generating a detection signal in response thereto; and

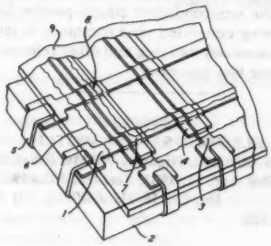
lamp turn-on means for turning on said illumination lamp in response to either said lamp control signal or said detection signal, including means having a monostable multivibrator responsive to said detector means so as to be triggered at the termination of said detection signal for gener-

ating a level signal for a predetermined period of time, on OR gate circuit having a first input terminal connected to said control circuit means to receive said lamp control signal and a second input terminal connected to said monostable multivibrator to receive said level signal, and switching means for turning on said illumination lamp in response to an output signal from said OR gate circuit.

4,549,093
TACTILE ARRAY SENSOR

Jeremy S. Severwright, Slough, England, assignor to EMI Limited, Hayes, England

Filed Sep. 28, 1983, Ser. No. 536,530
Claims priority, application United Kingdom, Sep. 29, 1982, 8227733
Int. Cl.⁴ H01H *13/00*; H01B *11/02*
U.S. Cl. 307—147 **10 Claims**



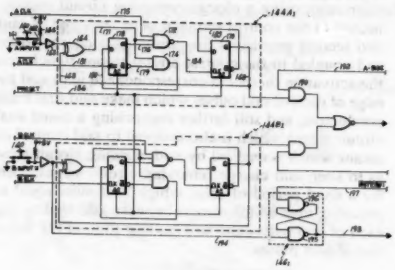
1. A tactile array sensor comprising:
a substrate,
a first array of electrical conductors disposed on the substrate,
a second array of electrical conductors overlying, and in crossing relationship with, the conductors of said first array,
an electrically insulative material disposed between the first array and the second array to create an insulative barrier at least at crossing points where a conductor of the second array crosses a conductor of the first array,
a sheet of an electrically conductive material overlying and engaging portions of said second array,
and means for maintaining said electrically conductive sheet and said first array in spaced apart relationship unless pressure is applied to the sheet.

4,549,094
DEBOUNCE CIRCUIT PROVIDING SYNCHRONOUSLY CLOCKED DIGITAL SIGNALS

William M. Floyd, Livonia, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 7, 1983, Ser. No. 540,586
Int. Cl.⁴ H03K *17/56, 5/01*
U.S. Cl. 307—247 A **3 Claims**

1. An improved debouncer circuit for providing debounced, synchronously-clocked digital signals from a single-throw switch comprising:
means for providing an input signal voltage which changes logic levels as a result of actuation of a single-throw input switch which is operable between open and closed states, said input signal being subject to switch bounce;
EXCLUSIVE OR gate means having two inputs, one said input having said input signal connected thereto;
an output data latch having a data input, a clock input, and complementary Q and Q* output terminals, a logic data level appearing at said data input being latched on said Q output terminal when said clock input receives a clocking signal, either of said Q or $\overline{Q}$ complementary output terminals providing the debounced, synchronously clocked digital signal resulting from said input signal voltage, a signal representing said Q* output terminal being connected to the data input of said output data latch for toggling both of said complementary output terminals upon receipt of a clocking signal at the latch clock input;
means for coupling said signal from said output data latch Q output terminal to said other input of said EXCLUSIVE OR gate means such that the output of said EXCLUSIVE OR gate means is a logic ONE level only when said two inputs thereto differ;
means for providing a synchronous clock signal having a period T_{DB}; and

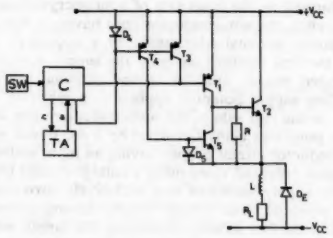


logic means coupled to the output of said EXCLUSIVE OR gate means and to said synchronous clock signal for providing a latch clocking signal as an output thereto in synchronism with said synchronous clock signal, said latch clocking signal being coupled to the clock input of said output data latch and thereby toggling the signal on said debounced output terminal only if said input signal voltage changes state and remains in the new state for at least a capture time interval of $T_{DB}+T_A$, where T_A represents the variable internal between the initial change of state of said input signal and the next occurring synchronous clock signal.

4,549,095
CONTROL CIRCUIT FOR SWITCHING INDUCTIVE LOADS

Fabrizio Stefani, Cardano al Campo; Carlo Cini, Cornaredo, and Claudio Diazzi, Milan, all of Italy, assignors to SGS-Ates Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Nov. 15, 1982, Ser. No. 441,851
Claims priority, application Italy, Nov. 13, 1981, 25054 A/81
Int. Cl.⁴ H03K *17/60, 3/26*
U.S. Cl. 307—254 **20 Claims**



1. A control circuit for switching an inductive load, said circuit comprising:
a control circuit means connected to a source of switching signals, said means generating electrical pulses in response to said signals, said pulses each having a leading and trailing edge;

a first and a second transistor, each having a first, a second, and a control terminal; wherein one of said first and second terminals of said first transistor is connected to one terminal of a two terminal D.C. supply voltage, the other of said first and second terminals and said control terminal of said first transistor being respectively connected to said control terminal of said second transistor and to said control circuit means, said first transistor being made conductive by said pulses generated by said circuit means;

wherein the second transistor, by means of its first and second terminals, is inserted in series with an inductive load which is connected between said two terminals of said D.C. supply voltage;

further comprising a charge removing circuit means, connected to the control terminal of at least one of said first and second transistors for removing a charge therefrom and coupled to the control circuit means which controls the activation thereof in correspondance with said trailing edge of each of said pulses which make said first transistor conductive, and still further comprising a timed enabling circuit means which is also coupled to said control circuit means which is enabled by said enabling circuit means so as to keep said charge removing circuit means operative for a fixed period of time, which is at most equal to the period of time which elapses between said trailing edge of each of said pulses and said leading edge of the following one of said pulses.

4,549,096

MONOLITHICALLY INTEGRATED SEMICONDUCTOR CIRCUIT WITH TRANSISTORS

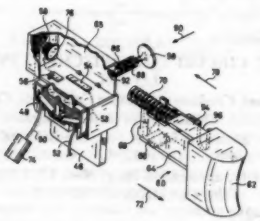
Kurt Hoffmann, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 227,505, Jan. 22, 1981,. This application Sep. 19, 1983, Ser. No. 533,615

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002894

Int. Cl.[4] H03F *3/42*

U.S. Cl. 307—297 **6 Claims**



1. Monolithically integrated semiconductor circuit having elements formed on the front side of a monocrystalline semiconductor chip, the semiconductor chip having a first and a second electric terminal addressable by a respective supply potential, the first terminal carrying the supply potential for the integrated circuit, and the second terminal carrying a substrate bias supply potential applied to a substrate region bordering on the rear side of the semiconductor chip, both of the supply potentials being delivered by a d-c power source, the semiconductor circuit proper having an input addressable by a reference potential, comprising a voltage divider bridging both of the supply terminals and exclusively providing the reference potential, said voltage divider having a first part connected to the first terminal delivering the supply potential for the integrated circuit, said first part being the semiconductor circuit proper to which the reference voltage is applicable, and a second part connected to the second terminal delivering the substrate bias supply potential and generating the reference potential as well as the substrate bias supply potential, said second part having means for delivering to the semiconductor circuit proper said reference potential at a constant value and independently of the respecti e operating state of the semiconductor circuit proper, the semiconductor circuit proper being directly connected to an output of said second part and including a source of another reference potential, and wherein said semiconductor circuit proper has an internal terminal for applying a supply potential differing from said reference potential, said internal terminal being directly connected to said first terminal of the semiconductor chip, said second part including a substrate bias generator having a substrate terminal identical with a further supply terminal for carrying said other reference potential, said further supply terminal identical with said substrate terminal being directly connected to said second supply terminal of the semiconductor chip and wherein said substrate bias generator comprises an operational amplifier with negative feedback having an output and a non-inverting and an inverting input, said output of said operational amplifier being directly connected to said inverting input thereof as well as to an internal supply input carrying said first-mentioned reference potential for the semiconductor circuit proper, said internal supply input being connected via a resistance to said substrate terminal simultaneously carrying said other reference potential for said substrate bias generator.

4,549,097

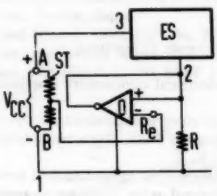
ELECTRIC SAFETY SWITCH

Jamie F. Ulmer, Box 102, Highway 70, Mt. Juliet, Tenn. 37122

Filed Apr. 11, 1983, Ser. No. 483,449

Int. Cl.[4] H02H *3/00*

U.S. Cl. 307—326 **9 Claims**



1. A control switch for mounting in a handle of a hand held power tool and being operated by a finger of an operator grasping such handle, such control switch providing for energization of such tool from a power source and for emergency deenergization of such tool without release of such finger, which comprises:

a switch housing for mounting in such handle;

a control member moveable in said switch housing by such finger sequentially along a selected direction, from an at rest "off" position to an energizing "on" position and to an emergency "off" position;

a first biasing means for resistive force against movement of said control member from said at rest "off" position to said emergency "off" position;

a further biasing means for resistive force against movement of said control member from said energizing "on" position to said emergency "off" position;

first actuating means responsive to movement of said control member from said at rest "off" position to said energizing "on" position for energizing such tool from such power source;

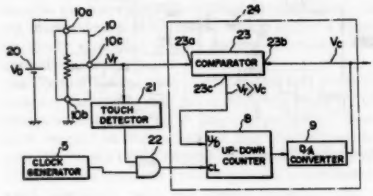
further actuating means responsive to movement of said control member from said energizing "on" position to said emergency "off" position for deenergizing such tool from such power source; and

means for automatically releasably locking said control member at said emergency "off" position until reset by such operator.

4,549,098
DEVICE FOR GENERATING A VARIABLE CONTROL SIGNAL

Tatsuo Fushiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 24, 1982, Ser. No. 410,999
Claims priority, application Japan, Sep. 9, 1981, 56-141964
Int. Cl.[4] H03K *5/19, 5/24;* H04R *5/04;* H04B *1/16*
U.S. Cl. 307—352 8 Claims



1. A device for generating a variable and adjustable control signal comprising:

variable voltage generating means which is capable of delivering a voltage in response to manipulation thereof, the level of the thus delivered voltage corresponding to a location along a dimension of said variable voltage generating means to which the manipulation is applied, means responsive to lack of manipulation for inhibiting said voltage generating means from delivering a voltage;

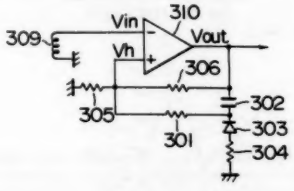
holding circuit means coupled to said variable voltage generating means for delivering a first signal corresponding to said voltage delivered under manipulation, and holding a voltage corresponding to the previously manipulated location and delivering a second signal corresponding to said held voltage during the time said voltage generating means is not manipulated; and,

an output terminal coupled to the output of said holding circuit means for receiving either one of said first and second signals as a control signal variably adjusted by manipulation of said voltage generating means.

4,549,099
PERIODIC SIGNAL DETECTING CIRCUIT INCLUDING COMPARATOR CIRCUIT WITH VARIABLE THRESHOLD AND VARYING TIME CONSTANT

Takashi Yamada, Anjo, and Mamoru Shimamoto, Nagoya, both of Japan, assignors to Nippondenso Company, Ltd., Kariya, Japan

Filed Apr. 22, 1983, Ser. No. 487,761
Claims priority, application Japan, Apr. 28, 1982, 57-71975
Int. Cl.[4] H03K *5/153*
U.S. Cl. 307—359 5 Claims



1. A periodic signal detecting circuit comprising:

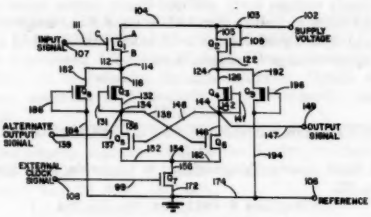
a comparator circuit for comparing an input periodic signal and a threshold voltage and generating an output changing from one state to another state when said signal exceeds said threshold voltage and changing from said another state to said one state when said signal decreases below said threshold voltage; and

a threshold voltage generating circuit responsive to said comparator circuit output to generate said threshold voltage, said threshold voltage generating circuit including time constant setting means for varying said threshold voltage with a predetermined time constant and means responsive to said change of state of said comparator circuit output to vary said time constant.

4,549,100
MOS VOLTAGE COMPARATOR AND METHOD

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 6, 1983, Ser. No. 492,102
Int. Cl.[4] G01R *19/165;* H03K *5/153*
U.S. Cl. 307—362 4 Claims



1. A semiconductor circuit for comparing an input signal voltage level against said circuit's supply voltage level and for providing a binary output signal in which a first binary state is outputted if said input signal voltage level exceeds the magnitude of level substantially equal to said supply voltage level, and in which a second binary state is outputted otherwise, said circuit adapted to operate from an external voltage supply providing said supply voltage level and a reference level at supply voltage and reference terminals, respectively, and controlled by an external clock signal defining an operating cycle having successive first and second time intervals, said circuit comprising:

first, second, third, fourth, and fifth nodes;

a first means connected to said supply voltage terminal and responsive to said input signal for coupling said input signal to said first node to establish and maintain a first voltage level thereon in controlled relation to said input signal voltage level during said operating cycle;

a second means connected to said supply voltage terminal and responsive to said supply voltage for coupling said supply voltage to said second node to establish and maintain a second voltage level thereon in controlled relation to said supply voltage level during said operating cycle;

a third means for conductively coupling said first voltage level to said third node to establish a third voltage level thereon during said operating cycle;

a fourth means for conductively coupling said second voltage level to said fourth node to establish a fourth voltage level thereon during said operating cycle;

a fifth means for controlling conduction between said third and fifth nodes in response to said fourth voltage level on said fourth node during said operating cycle;

a sixth means for controlling conduction between said fourth and fifth nodes in response to said third voltage level on said third node during said operating cycle;

a seventh means responsive to said clock signal for conductively connecting said fifth node to said reference terminal during said second time interval and for conductively isolating said fifth node from said reference terminal during said first time interval;

eighth means for providing a controlled conduction between

said first node and said reference terminal responsive to said reference level throughout said operating cycle; and

ninth means for providing a controlled conduction between said second node and said reference terminal responsive to said reference level throughout said operating cycle;

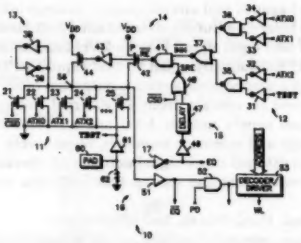
said third, fourth, fifth, and sixth means in combination with said third, fourth, and fifth nodes arranged and connected to operate as a bistable circuit element, the comparative magnitudes of said first and second voltage levels on said first and second nodes, respectively, urging upon said bistable element during said first time interval, a predisposition to regeneratively toggle to a binary state favored by said predisposition upon said seventh means conductively connecting said fifth node to said reference terminal during said second time interval, thereupon causing said binary output signal to be outputted on said fourth node, said output signal corresponding to said first binary state if the magnitude of said input signal voltage level has exceeded the magnitude of a voltage level equal to said supply voltage level, and said binary output signal corresponding to said second binary state if the magnitude of said input signal voltage level is less than or equal to said supply voltage level otherwise.

4,549,101

CIRCUIT FOR GENERATING TEST EQUALIZATION PULSE

Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1983, Ser. No. 556,761
Int. Cl.[4] H03K *5/04, 17/693*
U.S. Cl. 307—443 **10 Claims**



1. In an integrated circuit which includes a circuit for generating an equalization pulse in response to receiving one or more address transition signals on a multi-input logic circuit, wherein the equalization pulse will be present at least as long as a signal is present at an input of the logic circuit, an improvement comprising:

a test pad on the integrated circuit for receiving an external test signal; and

coupling means for coupling the test signal to an input of the logic circuit, wherein the test signal causes generation of the equalization pulse.

4,549,102

DRIVER CIRCUIT HAVING A BOOTSTRAP BUFFER CIRCUIT

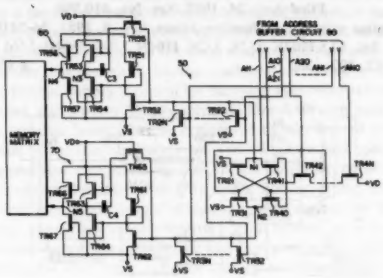
Makoto Segawa, and Shoji Arlizumi, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

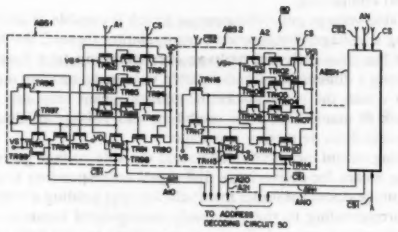
Continuation of Ser. No. 367,663, Apr. 12, 1982,. This application Mar. 8, 1985, Ser. No. 709,360
Claims priority, application Japan, Apr. 16, 1981, 56-57581
Int. Cl.[4] H03K *17/284, 17/30, 19/003, 19/096*
U.S. Cl. 307—578 **5 Claims**

1. A driver circuit comprising:

a bootstrap buffer circuit of the static type;

first drive means connected to drive said bootstrap buffer circuit and having a load circuit and a drive circuit coupled in series with said load circuit, and having means for generating an output signal at a junction between said load and drive circuits, said output signal being supplied to said bootstrap buffer circuit; and





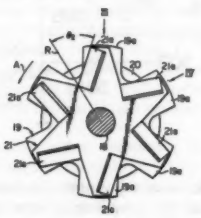
second drive means for applying to said first drive means a first drive signal for rendering said load circuit conductive and a second drive signal delayed with resepect to said first drive signal for rendering said drive circuit nonconductive after said load circuit is rendered conductive.

4,549,103

MULTI-PATH COOLING IN AN AC GENERATOR FOR A VEHICLE

Tsutomu Shiga, Aichi, Japan, assignor to Nippondenso Co. Ltd., Kariya, Japan

Continuation of Ser. No. 358,901, Mar. 17, 1982, Pat. No. 4,418,295, which is a continuation of Ser. No. 194,603, Oct. 6, 1980,. This application Oct. 27, 1983, Ser. No. 546,190
Claims priority, application Japan, Oct. 9, 1979, 54-129429; Oct. 12, 1979, 54-131565
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—60 R **7 Claims**



1. An AC generator for vehicles comprising:

a housing including a generally cylindrical peripheral wall portion extending between end wall portions, each of said end wall portions having formed therein openings for air passage;

a stator assembly disposed within said housing and fixed to said cylindrical wall portion at a location between first and second spaced air outlet openings in the cylindrical wall said stator assembly in spaced relationship therewith, the rotor assembly including a rotor shaft, a rotor coil, and a rotor core carrying said rotor coil, said rotor core being fixed to the rotor shaft for rotation therewith and comprising interleaved pole members which define a plurality of angularly separated fingers having therebetween axially entending spaces;

a first cooling fan secured to one end of said rotor core for rotation therewith, said fan including a plurality of vanes obliquely extending at an angle greater than 90 degrees with respect to the surface of said one end of the rotor core, the vanes being disposed in overlapping relationship with one side portion of said stator coil and in substantially axial alignment with the spaces between said fingers, whereby during rotation of the rotor core, the fan draws air through the openings in one of said end wall portions and directs the air (1) radially of the housing past said stator assembly and through the first air outlet opening in the cylindrical wall portion and (2) axially of the housing through the spaces between the rotor core fingers, and between the rotor and stator assemblies; and

a second cooling fan secured to the other end of said rotor core for rotation therewith and including a plurality of vanes disposed in overlapping relationship with the other side portion of said stator coil and arranged such that, during rotation of the rotor core, the second fan draws air through the openings in the other of said end wall portions and directs this air, as well as that air axially directed by the first cooling fan through the spaces between the rotor core fingers and between the rotor and stator assemblies, substantially only radially of the housing past said stator assembly and through the second air outlet opening in the cylindrical wall portion.

4,549,104

MOTOR OF THE PERMANENT-MAGNET ROTOR TYPE

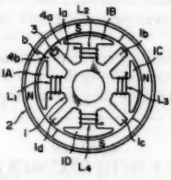
Yoshihisa Niimura, Tokyo, and Shin Shimamura, Kawaguchi, both of Japan, assignors to Sanyo Denki Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,203

Claims priority, application Japan, Dec. 7, 1982, 57-185216[U]

Int. Cl.⁴ H02K *29/02*

U.S. Cl. 310—67 R **12 Claims**



1. A motor of the permanent-magnet rotor type comprising:

a stator having a plurality of main poles and a plurality of complementary poles integrally formed thereon, said main poles being arranged to be spaced from each other in the circumferential direction of said rotor and each having a field winding provided thereon, said complementary poles being arranged between the respective adjacent two main poles in a manner to be spaced from said main poles;

said plurality of complementary poles being magnetized when an exciting current is flowed through said field windings of said main poles to allow said main poles to be magnetized;

a permanent-magnet rotor having a plurality of magnetic poles annularly arranged opposite to the pole faces of said main and complementary poles, said rotor being arranged concentric with said stator;

said plurality of magnetic poles being combined with each other in turn and magnetized to allow N and S poles to alternately appear thereon in turn; wherein

a gap G_1 between the pole face of each of said main poles and each of said magnetic poles of said rotor is defined to gradually increase in width; and

a gap G_2 between the pole face of each of said complementary poles and each of said magnetic poles is defined to have substantially the same width as the maximum width of said gap G_1.

4,549,105

SUBMERGIBLE MOTOR INCLUDING CIRCUIT ELEMENT ENCASED IN MOLDED PLUG

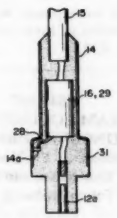
Sakuei Yamamoto; Mitsuhiro Nishida; Hiroshi Inao; Noboru Tashiro, all of Fukuoka, and Kiyoshi Hani, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 9, 1984, Ser. No. 569,140

Claims priority, application Japan, Jan. 7, 1983, 58-1366; Jan. 7, 1983, 58-1367; Jan. 7, 1983, 58-1368; Aug. 25, 1983, 58-156661; Aug. 25, 1983, 58-156662

Int. Cl.⁴ H01R *13/52, 13/68;* **H02K** *11/00*

U.S. Cl. 310—87 **6 Claims**



1. A submergible motor, comprising;

a motor winding, an insulated power supply conductor for connection to a power supply, an insulated motor conductor connected to said motor winding, and circuit means electrically connected between said power supply and motor conductors, said circuit means comprising a lightning arrester and starter circuit means arranged serially between said power supply and motor conductors, said lightning arrester and starter circuit means being encapsulated in a solidified molded material in a water-resistant manner and being integrally formed with at least one of said power supply and motor conductors, and a tubular metallic sleeve for encasing said circuit means and said encapsulating material, and engaging a bracket portion of said motor.

4,549,106

FOUR-FIVE ALTERNATOR COIL WINDING

Lebern W. Stroud, 321 Charleston Pl., Hurst, Tex. 76053

Continuation of Ser. No. 331,644, Dec. 17, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,439

Int. Cl.⁴ H02K *3/00*

U.S. Cl. 310—184 **3 Claims**

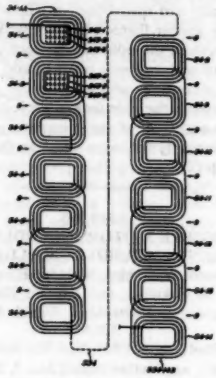
1. An alternator of the type having an annular stationary stator with a rotor concentrically located therein, comprising:

an annular structure formed of ferro-magnetic material defining an annular stator core having forty-two segments

with adjacent segments being separated by a slot such that there are forty-two slots which extend in a direction parallel to the axis of said stator core, and

a three phase stator winding connected in a delta configuration,

each phase comprising a winding having fourteen coils extending around said stator core on the inside thereof,



each of said coils of each phase winding comprising a plurality of turns of wire encircling three segments,

said fourteen coils of each phase winding having a plurality of turns located in fourteen of said slots such that said fourteen slots for each phase winding respectively have the following number of turns located therein 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9.

4,549,107

ULTRASONIC BEAM FOCUSING DEVICE WITH A CONCAVE SURFACE

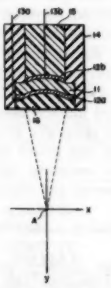
Nagao Kaneko, Yokohama; Yoshinori Fujimori, Kawasaki; Seizaburo Shimizu, Yokohama, and Shin Obara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 523,599, Aug. 16, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 698,757

Claims priority, application Japan, Sep. 28, 1982, 57-168868

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—327 **8 Claims**



1. A λ/2 wavelength mode ultrasonic beam focusing device with a concave surface comprising:

a cylindrical housing having a step inside a distal end thereof;

a circular piezoelectric polymer film which is formed contiguously with said step, which is curved in a concave form raltive to an acoustically active surface thereof, and which has a pair of circular electrodes at two respective surfaces thereof, said piezoelectric polymer film generating, in response to a signal applied to said electrodes, an ultrasonic beam, which is focused at a single point, and transducing a received ultrasonic beam into an electric signal;

leads respectively connected to said electrodes;

a rigid polyurethane supporting substrate which is filled in said housing so as to directly contact said electrode which is at the side of an acoustically inactive surface of said piezoelectric polymer film, said rigid polyurethane layer absorbing an ultrasound beam at the side of the acoustically inactive surface and supporting said piezoelectric polymer film; and

an insulating layer which is formed to be in contact with said electrode inside said housing which is at the side of said acoustically active surface of said piezoelectric polymer film for electrically insulating said electrode.

4,549,108

MULTICHANNEL X-RAY DETECTOR WITH MULTIPLE ELECTRICAL FEEDTHROUGH MEMBERS

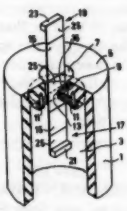
Joannes L. G. Hermens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 497,464

Claims priority, application Netherlands, Jun. 4, 1982, 8202258

Int. Cl.⁴ G01T *1/18*

U.S. Cl. 313—93 **4 Claims**



1. In a gas-filled multi-channel X-ray detector comprising a housing having at least one wall, a plurality of electrodes in said housing, a plurality of feedthrough members passed through said wall, said feedthrough members being electrically insulated from one another, the improvement comprising each of said feedthrough members including a flexible printed tape member, said tape member forming in part a plurality of electric conductors to said electrodes, and said tape member having an insulating envelope sealing said tape member to said wall,

wherein said insulating envelope includes a cover in said wall with a slotted opening through which said tape member passes, and a glue plug for sealing said opening.

4,549,109

OPTICAL DISPLAY WITH EXCIMER FLUORESCENCE

William L. Nighan, Manchester; Walter J. Wiegand, Glastonbury, and Carl M. Ferrar, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 322,098, Nov. 16, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,199

Int. Cl.⁴ H01J *1/62, 63/04*

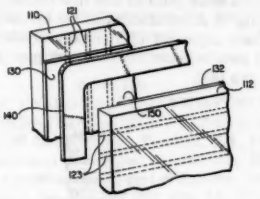
U.S. Cl. 313—485 **5 Claims**

1. An optical display device comprising:

a gas-tight enclosure, a portion of which is optically transmissive in the visible region of the electromagnetic spectrum, whereby optical display radiation may be emitted from said device;

a predetermined gaseous mixture comprising at least one gas species enclosed in said gas-tight enclosure;

a plurality of electrodes disposed in such a manner that a portion of radiation generated within said gas-tight enclosure in response to an electric discharge passing between at least two of said electrodes passes through said optically transmissive portion of said gas-tight enclosure;



means for passing an electric discharge between at least two of said electrodes; and

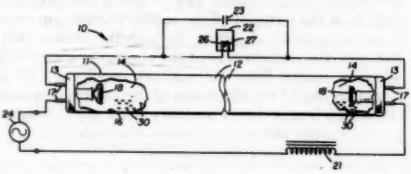
a predetermined concentration of heteronuclear excimer states within said gaseous mixture that emit visible electromagnetic radiation upon dissociative de-excitation.

4,549,110

MAGNETIC FLUORESCENT LAMP HAVING REDUCED ULTRAVIOLET SELF-ABSORPTION

Samuel M. Berman, San Francisco, Calif., and Robert W. Richardson, Pelham, N.Y., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,849
Int. Cl.⁴ H01J *61/38;* H05B *31/28*
U.S. Cl. 313—485 **9 Claims**



1. A fluorescent lamp assembly comprising:

a bulb containing an inert gas and mercury,

a phosphor coating on said bulb,

means for causing an electron flow along a predetermined path through said bulb, and

means for establishing a magnetic field having lines of force extending along said path of electron flow, said magnetic field having a strength such that the Zeeman splitting of the ultraviolet resonance radiation is approximately 1.7 times the thermal line width of that radiation.

4,549,111

VHF RADIOELECTRIC WAVE GENERATOR

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 30, 1982, Ser. No. 431,151
Claims priority, application France, Jan. 22, 1982, 82 01013
Int. Cl.⁴ H01J *25/00*
U.S. Cl. 315—4 **8 Claims**

1. A microwave generator comprising

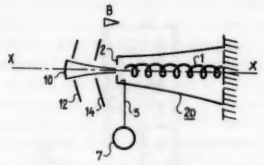
(a) means including an electron gun (**10, 12, 14**) for generating an electron beam (**1**) along an axis (x—x);

(b) means for subjecting said electron beam to the action of a magnetic field (B) directed along said axis (x—x);

(c) waveguide means arranged along said axis for subjecting said electron beam to the action of an electromagnetic field;

(d) means coupled to said waveguide means for applying an electromagnetic wave (**5, 7**) at a frequency equal to the cylotron frequency fc of the electrons of the beam in the magnetic field;

(e) means for connecting to an output which receives energy at a frequency close to a multiple of said cyclotron frequency (n.fc);



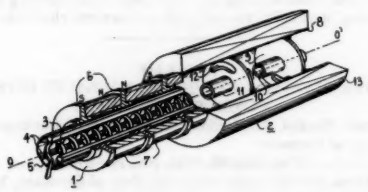
(f) said waveguide means comprising a plurality of cavity resonators (**20**) which are coupled to said means for applying said electromagnetic wave, and which has an axis along said beam and which also has a cross section whose area varies along the axis of said wave guide, so that the cyclotron frequency of electrons in said electron beam and a Doppler shift frequency of the electron beam along the path of the electron beam are equal.

4,549,112

DELAY LINE FOR A TRAVELLING WAVE TUBE

Georges Fleury, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 17, 1982, Ser. No. 450,521
Claims priority, application France, Dec. 22, 1981, 81 23956
Int. Cl.⁴ H01J *25/34*
U.S. Cl. 315—3.6 **5 Claims**



1. A delay line for a traveling wave tube, comprising two parts:

a first part, formed from a helical derived delay line section comprising a central conductor mounted in a cylindrical sleeve by means of dielectric rods, this first part, situated on the high frequency input side of the tube being focused by means of a succession of permanent magnets with alternate orientations;

a second part, following the first one, having a metal slow wave circuit of the coupled cavity delay line type or of the ceiling and ring delay line type focused by a permanent magnet or solenoid other than a succession of permanent magnets with alternate orientations.

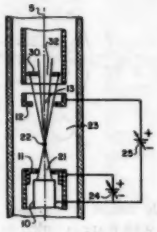
4,549,113
LOW NOISE ELECTRON GUN

Nidamboor V. Rao, Foster, R.I., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 232,350, Feb. 6, 1981, Pat. No. 4,388,556, which is a continuation of Ser. No. 11,468, Feb. 12, 1979, , which is a continuation-in-part of Ser. No. 877,080, Feb. 13, 1978,. This application Jan. 24, 1983, Ser. No. 460,416

Int. Cl.⁴ H01J *29/46, 29/56*

U.S. Cl. 315—14 **3 Claims**



1. A device for generating an electron beam comprising:

a cathode;

a first electrode spaced from said cathode along an axis extending through said cathode, said first electrode having an aperture generally concentric with said axis;

means for applying to said first electrode a first voltage which is positive with respect to and is sufficient to extract electrons from said cathode;

a second electrode spaced from said first electrode along said axis, the first electrode being between the cathode and said second electrode;

means for applying to said second electrode a second voltage which is positive with respect to said cathode and is sufficiently higher than said first voltage to produce an electric field defining an electron lens for converging the electrons emitted from said cathode to a crossover in the region between the first and second electrodes; and

a beam limiting element, spaced from said first electrode along said axis such that the first electrode is between the cathode and said beam limiting element, having formed therein a beam limiting aperture generally concentric with said axis for passing said electrons therethrough to thereby produce said electron beam of a cross-section determined by the size of said beam limiting aperture, said beam-limiting element being physically distinct from said second electrode.

4,549,114
SPARK PLUG FOR EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE

Werner Herden, Hölderlinstrasse 5, D-7016 Gerlingen, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,007

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308522

Int. Cl.⁴ H01J *7/44, 13/46, 19/78, 29/96*

U.S. Cl. 315—58 **14 Claims**

1. Spark plug defining a connection end and a sparking end having

a spark cable terminal (27, 28) to receive spark energy, at the connection end;

a tubular metal housing (11) having a counter electrode (15) at the sparking end;

a tubular insulator (17) within the tubular metal housing;

a center electrode (40) sealingly received in the tubular insulator (17) and having a terminal end portion positioned close to, but spaced from, the counter electrode (15) to define a main spark gap (42) therewith;

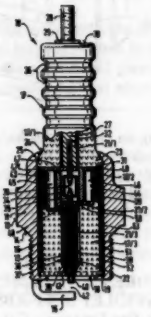
an electrical connection path including an auxiliary or pre-spark gap (33) coupling the cable terminal (27, 28) to the center electrode (40),

said spark gap cable terminal (27, 28), the pre-spark gap (33), the center electrode (40), the main spark gap (42) and the counter electrode (15) defining a first circuit branch;

and a shunt capacitor (51) having one electrode terminal connected to the spark cable terminal (27, 28), and another electrode terminal connected to the counter electrode (15) to form a shunt path to said first circuit path,

comprising, in accordance with the invention,

an auxiliary capacitor (37) serially connected in the first circuit path between the pre-spark gap (33) and the main spark gap (42);



a first charging resistor (45) having high-resistance value connected in parallel to the pre-spark gap (33) and the auxiliary capacitor (37);

and a second charging resistor (46) having high-resistance value being connected in parallel to the auxiliary capacitor (37) and the main spark gap, to form a charging circuit path from the terminal of the auxiliary spark gap remote from the auxiliary capacitor, through the resistor (45) to that one of the electrodes of the auxiliary capacitor (37) which is remote from the auxiliary spark gap (33) and from that one of the electrodes of the auxiliary capacitor (37) which is close to the auxiliary spark gap through the second resistor (46) to the counter electrode (15).

4,549,115
HEAT-SENSITIVE VARIABLE-RESISTANCE LIGHT SOCKET INSERT WITH RESILIENT CONTACT

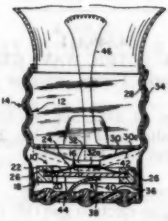
Eric A. Kolm, Brookline, and Henry H. Kolm, Wayland, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Mar. 30, 1983, Ser. No. 480,354

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.⁴ H01J *7/44;* **H05B** *37/00*

U.S. Cl. 315—71 **19 Claims**



14. A heat-sensitive variable-resistance insert device for use with a light bulb and socket comprising:

a heat-sensitive variable-resistance wafer for interconnecting the central contact of the socket with the central contact of the light bulb;

a perimetrical insulation member surrounding the edge of said wafer and electrically insulating it from the wall of the socket; and

first and second resilient convex disc contacts, one mounted on each side of said wafer and each having an outer edge which contacts said wafer for resiliently engaging the associated central contacts and accommodating for variations in the distance between the central contacts.

4,549,116

ELECTRIC ENERGY SAVING TWO-POSITION COMBINATION SWITCHING DEVICE

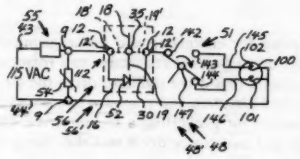
Peter Andrews, 190 Gebhardt Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 761,528, Jan. 24, 1977, abandoned, and a continuation-in-part of Ser. No. 738,227, Nov. 1, 1976, abandoned, Ser. No. 442,082, Feb. 12, 1974, Pat. No. 4,005,334, and Ser. No. 544,579, Jan. 27, 1975, abandoned, said Ser. No. 738,277, is a continuation-in-part of Ser. No. 442,082, and a continuation-in-part of Ser. No. 544,579, which is a continuation-in-part of Ser. No. 442,082, , , and Ser. No. 250,949, May 8, 1972, abandoned, said Ser. No. 442,082, and Ser. No. 250,949, each is a continuation-in-part of Ser. No. 240,605, Apr. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 025,994, Apr. 6, 1970, abandoned. This application Jun. 26, 1981, Ser. No. 277,598

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.⁴ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—200 R **38 Claims**



1. An electric energy saving two-position electric switching device having no electrical "off" position and having only an electrical half-wave "dim" and a full-wave "on" position for electrical connection to a two-conductor wire member of an electric cord member, comprising in combination: an electric insulating housing having an upper casing portion and a lower casing portion for being juxtapositioningly mounted by a securing means on said cord member; said upper casing portion having housed therein a one-piece first electrical contact member and a second electrical contact member each of which is formed from a resilient electrical conducting material, a half-wave diode electric rectifying means and a one-piece rotatable electric current conducting contact member; said upper casing portion also having a manually operable switch actuation means substantially housed therein for operatively actuating a pivotly mounted rotatable member having an electric insulating switching portion integrally formed on substantially one end portion of said actuation means; said switching portion having said conducting contact member substantially retained to at least one portion thereof for electrical switching rotation therewith so that when it is in its alternatingly first switched position said conducting contact member is electrically connected to said first said contact member and said second said contact member and when it is in its second switched position said conducting contact member is not electrically connected to said first said contact member and said second said contact member so that only an electrical full-wave "on" and a half-wave electrical rectified "dim" position is thereby obtained by having said rectifying means electrically connected to said first said contact member and said second said contact member; said lower casing portion having a substantially channel-like opening entirely through two outer end wall portions thereof for removably receiving a longitudinal portion of said two-conductor wire member having a first wire member and a second wire member therein; said lower casing portion will substantially house therein one uncut said first wire member and said second wire member which has a first and a second cut and separated wire end portions; said first cut end portion will be electrically connected by an electric wire connecting means to a portion of said first said contact member, and said second cut end portion will be electrically connected by an electrical wire connecting means to a portion of said second said contact member; said electric two-position switching device is so constructed and arranged that when it is electrically connected and mounted on said cord member and is in electrical connected combination with and ahead of a 4-position electric switching means having an electrical "off", low, medium and high switching positions for a 3-way incandescent lamp then eight separate combinations of one OFF and three separate illuminations may be provided by said 3-way said lamp without having any electrical OFF position in between any of said separate combinations.

4,549,117

CIRCUIT FOR GENERATING SIGNAL FOR CORRECTING DEFLECTION OF ELECTRON BEAM

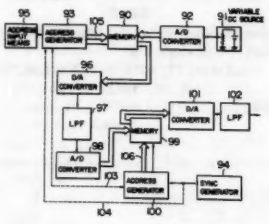
Kenji Takahashi, Kanagawa; Shizuka Ishibashi, Musashimurayama; Koji Kudo, Hachioji; Yukihiro Masuda, Kodaira, and Takuma Kodama, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha Ltd., both of Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,208

Claims priority, application Japan, Mar. 11, 1983, 58-40456

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—371 **8 Claims**



1. A circuit for generating a signal for correcting deflection of an electron beam, comprising:

memory means for storing in terms of digital values quantities of the correction at intersections defined by a plurality of lines extending in horizontal and vertical directions so as to divide a surface scanned by the electron beam into a plurality of areas;

conversion means for converting the digital signal read out from said memory means into an analog signal;

low-pass filter means for passing therethrough low frequency components of said analog signal outputted from said conversion means; and

means for generating from the output of said low-pass filter means quantities of correction for the scanning lines present between the two intersections located adjacent to each other in the vertical direction.

4,549,118

STEP WAVEFORM GENERATOR AND CRT VERTICAL TIMEBASE INCORPORATING SUCH A GENERATOR

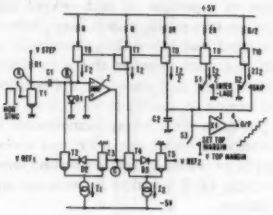
Terence G. Cole, and Roderick M. West, both of Southampton, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,127

Claims priority, application European Pat. Off., Apr. 29, 1983, 83302444.1

Int. Cl.⁴ H01J *29/72*

U.S. Cl. 315—393 **5 Claims**



1. A step waveform generator comprising a cup and bucket charge circuit in which a cup capacitor is alternately charged and discharged in response to each pulse of an input pulse train supplied thereto and increments of charge from said cup capacitor are transferred successively to a bucket capacitor where they are accumulated, characterized in that the circuit includes an operational amplifier connected to monitor voltage across the cup capacitor and operable in response to a voltage of one polarity to switch a first current source into a first feedback loop in order to discharge the cup capacitor or in response to a voltage of the opposite polarity to switch a second current source into a second feedback loop in order to charge the cup capacitor, independently of the charge on said bucket capacitor.

4,549,119

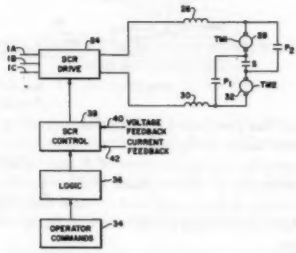
CONTROL SYSTEM AND METHOD FOR OPERATING MINING MACHINE TRACTION MOTORS AND THE LIKE

Richard M. Slagle, Grove City, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 27, 1984, Ser. No. 604,750

Int. Cl.⁴ H02P *7/72*

U.S. Cl. 318—11 **10 Claims**



1. Apparatus for controlling DC traction motors connected to drive wheels on an electrically energized vehicle comprising: means connecting said traction motors in series across the output terminals of an SCR converter having SCR's therein, means for accelerating said motors while controlling the firing angles of said SCR's such that the current and voltage supplied to said motors increase along ramps until desired normal operating values of voltage and current are reached with the voltage across the series-connected motors being of a substantially greater value than the value it would be if the motors were connected in parallel, means for maintaining said motors in a series-connected configuration during normal essentially steady-state operation of said motors while maintaining the voltage across said motors at said substantially higher value, and means for selectively connecting said motors in parallel when at least one of said drive wheels is slipping during series-connected operation of said motors.

4,549,120

TURNTABLE DC BRUSHLESS MOTOR STOPPING CONTROL

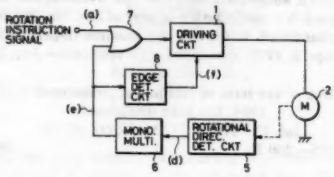
Tsutomu Banno; Michiaki Hayashi, and Hitoshi Senso, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,224

Claims priority, application Japan, Jul. 19, 1982, 57-109177[U]

Int. Cl.⁴ H02P *6/02*

U.S. Cl. 318—254 **6 Claims**



1. A device for energizing and deenergizing a d.c. motor comprising: driving means responsive to a rotation instruction for generating a first drive signal to drive the d.c. motor in a predetermined direction and responsive to a rotation termination instruction for generating a second drive signal to slow said motor and eventually drive said d.c. motor in a reverse direction,

detection means for detecting reverse rotation of the d.c. motor and producting a detection signal when said motor is rotating in said reverse direction, said driving means being responsive to the detection signal to apply said first signal to the d.c. motor for a predetermined period of time.

4,549,121

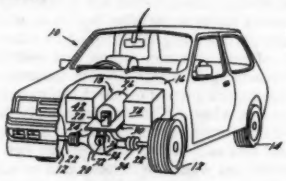
MOTOR MINIMUM SPEED START-UP CIRCUIT FOR ELECTRIC MOTORS

Allan R. Gale, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1984, Ser. No. 645,223

Int. Cl.⁴ H02P *5/16*

U.S. Cl. 318—301 **4 Claims**



1. A minimum speed start-up circuit for use in an electric motor vehicle for providing a minimum torque output from the

motor when an operator commands the vehicle to accelerate at low motor speeds comprising:

speed determining means for providing a signal indicative of the present speed of the motor;

demand current generating means for generating operating current to be delivered to the motor to drive the motor for normal operation of the vehicle;

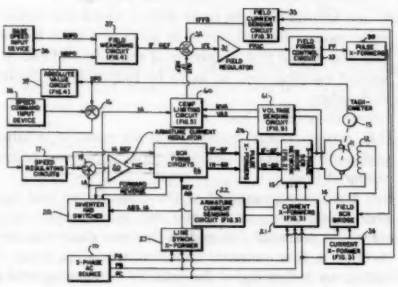
minimum torque demand current generating means for generating a minimum demand current to be delivered to the motor when the operator commands the vehicle to accelerate at a motor speed below a predetermined limit; and

means for selectively supplying the motor with the greater of the operating current or the minimum demand current so that at least a minimum torque is output by the motor when the operator commands the vehicle to accelerate at low speeds.

4,549,122
METHOD AND CIRCUIT FOR DC MOTOR FIELD REGULATION WITH SPEED FEEDBACK

William E. Berkopec, Milwaukee, and James A. Burns, Menomonee Falls, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 14, 1983, Ser. No. 532,067
Int. Cl.⁴ H02P *5/06*
U.S. Cl. 318—338 **6 Claims**



1. A method of operating a DC motor of the type having a field winding and a rotating armature to control the rotational speed of the armature when the DC motor is operated above base speed in the constant horsepower speed range, the DC motor also being of the type that generates a counter-EMF, the method comprising:

generating a speed feedback signal proportional to the speed of the armature;

generating a speed error signal in response to the speed feedback signal and a speed command input in the constant horsepower speed range;

driving the speed of the DC motor above base speed in response to the speed error signal;

sensing field current to generate a field current feedback signal;

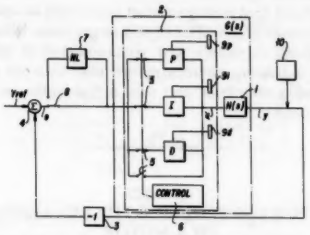
generating a field reference signal and algebraically summing the field reference signal with the field current feedback signal to control the energizing of the field winding at rated field current when the motor is operated at a speed below base speed; and

reducing the field reference signal that is summed with the field current feedback signal in response to a speed feedback signal that represents a speed greater than the base speed to cause a reduction in field current below rated field current.

4,549,123
METHOD AND AN APPARATUS IN TUNING A PID-REGULATOR

Tore Hägglund, and Karl J. Aström, both of Lund, Sweden, assignors to NAF Controls AB, Solna, Sweden

PCT No. PCT/SE82/00268, § 371 Date Mar. 21, 1983, § 102(e) Date Mar. 21, 1983, PCT Pub. No. WO83/00753, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 23, 1982, Ser. No. 478,560
Claims priority, application Sweden, Aug. 24, 1981, 8104989-2
Int. Cl.⁴ G05B *11/42*
U.S. Cl. 318—610 **8 Claims**

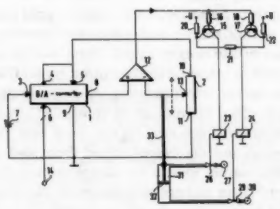


1. In tuning a regulator (2) of the PID type of process (1) in a feedback system where the process and the regulator have a transfer function G(s) in common, a method of bringing the system into self-oscillation, whereupon the amplitude and the frequency of said self-oscillation are determined and the regulator is tuned in dependence upon the values determined for the amplitude and the frequency of the self-oscillation, characterized in that for achieving said self-oscillation a non-linear circuit function (NL) which has such a describing function N(A) that $G(i\omega)\cdot N(A) = -1$ for at least one value of the angular frequency ω and the amplitude A of an input signal, is connected in series to the process (1), whereupon the circuit function is removed after the amplitude and the frequency of the self-oscillation have been determined.

4,549,124
CIRCUIT ARRANGEMENT FOR CONTROLLING THE ACTION OF AN ADJUSTING DEVICE, IN PARTICULAR FOR A PATIENT CHAIR

Stefan Beier, Biberach an der Riss, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,112
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207068
Int. Cl.⁴ G05B *1/06*
U.S. Cl. 318—663 **6 Claims**



1. A circuit arrangement for controlling the action of an adjusting device comprising:

an action mechanism connected to said adjusting device and operable in response to a control input;

a comparator for comparing a target value of a desired position with an actual value of an actual position and producing an output signal representing the difference therebetween fed as said control input to said action mechanism, whereby said action mechanism is operated to cause a reduction in said difference between said target value and said actual value;

a target value indicator including a digital-analog converter for supplying said target value;

an actual value indicator including a potentiometer controlled by operation of said adjusting device for supplying said actual value; and

an equalized feed voltage circuit connected to operate said digital-analog converter of said target value indicator and connected to supply said potentiometer of said actual value indicator, whereby mutual drift between said digital-analog converter and said actual value indicator is eliminated.

4,549,125

CIRCUIT FOR CONTROLLING THE ROTATION ANGLE OF A MOTOR

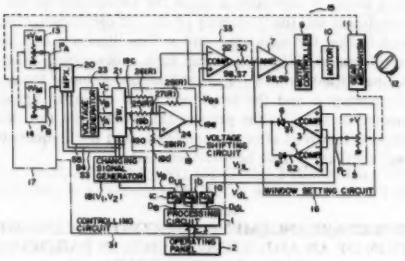
Yougi Sonobe, Tokyo, Japan, assignor to Anritsu Electric Company Limited, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,973

Claims priority, application Japan, May 31, 1983, 58-94786

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—663 **7 Claims**



1. A circuit for controlling the rotation angle of a motor by comparing an output signal from angle setting means with a detection result of potentiometer means for detecting the rotation angle of the motor while the motor is driven in response to the output signal from said angle setting means, comprising: a first potentiometer for detecting the rotation angle of the motor; a second potentiometer for detecting another rotation angle at a phase different from that of said first potentiometer; interval selecting means for selecting one of a plurality of interval signals in response to the output signal generated from said angle setting means; potentiometer selecting means for selecting one of the output signals from said first and second potentiometers in response to the output signal from said interval selecting means; compensating signal generating means for generating an offset compensating signal for compensating for an offset between a selected signal from said potentiometer selecting means and the output signal from said angle setting means; compensating means for compensating for one of the selected signal from said potentiometer selecting means and the output signal from said angle setting means in accordance with the offset compensating signal from said compensating signal generating means; and comparing means for comparing one compensated signal and another noncompensated signal by said compensating means and for controlling the motor in accordance with a comparison result.

4,549,126

PULSE MOTOR-DRIVING CIRCUIT

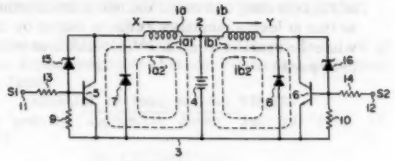
Yasufumi Tanimoto, and Masahiko Ogura, both of Fujisawa, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 14, 1984, Ser. No. 580,138

Claims priority, application Japan, Feb. 23, 1983, 58-28697

Int. Cl.[4] H02P *8/00*; G05B *19/40*

U.S. Cl. 318—696 **1 Claim**



1. A pulse motor-driving circuit comprising:

first and second exciting coils wound about the stator of a pulse motor, and connected in series at a node between a first end of said first exciting coil and a second end of said second exciting coil, so as to be inductively coupled to each other;

a reference potential line;

a D.C. power source connected at the positive terminal to said node and at the negative terminal to said reference potential line;

a first transistor connected at the collector to said second end of said first exciting coil and at the emitter to said reference potential line and to the base electrode thereof through a first resistor, said first transistor being controlled by a first signal for selectively exciting said first exciting coil;

a second transistor connected at the collector to said first end of said second exciting coil, and at the emitter to said reference potential line and to the base electrode thereof through a second resistor, said second transistor being controlled by a second signal for selectively exciting said second exciting coil;

commutation means which inductively transfers a first exciting current of said first exciting coil to said D.C. power source, through said second exciting coil, when said first transistor is rendered nonconductive, and which also transfers a second exciting current of said second exciting coil to said D.C. power source, through said first exciting coil, when said second transistor is rendered nonconductive; and

a first Zener diode whose cathode is connected to the collector of said first transistor, and whose anode is connected to the base electrode of said first transistor, and a second Zener diode whose cathode is connected to the collector of said second transistor, and whose anode is connected to the base electrode of said second transistor, each of said first and second Zener diodes being chosen so as to have a breakdown voltage over three times the voltage across said D.C. power supply source but lower than the withstand voltage between the collector and the emitter of said first and second transistors.

4,549,127
BATTERY CHARGING

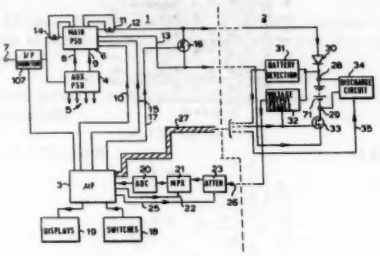
Andrew J. Taylor, and Philip J. McGillvray, both of Cowes, England, assignors to Electronic Designs (I.W.) Limited, Cowes, England

Filed Mar. 5, 1984, Ser. No. 586,064

Claims priority, application United Kingdom, Mar. 4, 1983, 8306071

Int. Cl.⁴ H02J *7/10*

U.S. Cl. 320—21 **20 Claims**



1. A method of charging a battery, comprising the steps of:
(a) supplying a plurality of current pulses of a first type to the battery;
(b) measuring the off-load voltage of the battery between current pulses of said first type;
(c) determining a first voltage drop during a first period following a current pulse of said first type;
(d) determining a second voltage drop during a second period following said current pulse of said first type of said step (c) but before a next current pulse of said first type, where the end of said second period is later than the beginning of said first period;
(e) determining the ratio of said first and second voltage drops;
(f) repeating said steps (c) to (e) for subsequent current pulses of said first type to form a sequence of ratios; and
(g) stopping the supply of said current pulses of said first type after said sequence of ratios has reached a peak value and when a ratio is determined which is less than said peak value by a predetermined amount or proportion.

13. An apparatus for charging a battery, comprising: means for supplying current pulses of a first type to the battery; means for measuring the off-load voltage of the battery between said current pulses; and means for determining the first voltage drop during a first time period following each of at least some of said current pulses, for determining the second voltage drop during a second period following each of said at least some of said current pulses wherein the end of each said second period follows the beginning of each said first period, for determining the ratios of said first and second voltage drops, and for preventing said pulse supplying means from supplying said current pulses of said first type when the value of said ratio falls below a peak value of said ratios by a predetermined amount.

4,549,128
CHARGING GENERATOR CONTROLLING DEVICE

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

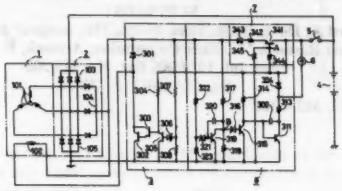
Filed Nov. 9, 1983, Ser. No. 550,145

Claims priority, application Japan, Nov. 9, 1982, 57-197914; Nov. 9, 1982, 57-197915; Nov. 9, 1982, 57-197916; Nov. 9, 1982, 57-197917

Int. Cl.⁴ H02J *7/14;* **H02P** *9/04*

U.S. Cl. 322—99 **4 Claims**

1. A charging generator controlling device comprising:
a charging generator having field and armature coils;
rectifier means for rectifying AC outputs induced in said armature coils of said charging generator, said rectifier means having first and second rectifier output terminals and a ground terminal, said field coil being coupled to an output terminal of said rectifier means to be excited thereby;
a battery coupled to an output provided at said first rectifier output terminal of said rectifier means;
voltage regulation means for controlling application of current to said field coil, to thereby maintain an output voltage of said generator at a first predetermined value;



a charge display lamp connected through a keyswitch between said battery and said ground terminal;
a first switching unit connected between said keyswitch and said second rectifier output terminal;
a second switching unit connected in series with said charge lamp and said ground terminal;
detection means for detecting said second rectifier output terminal voltage to thereby detect uncontrolled and non-power-generation states; and
a diagnosing unit for actuating said switching units in response to outputs of said detection means.

4,549,129
REGULATOR CIRCUIT

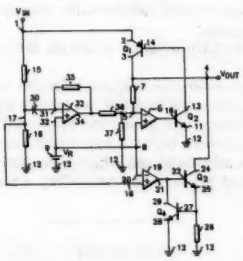
Samath Hing, Gland, Switzerland, and Michel Guillien, Gex, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1983, Ser. No. 485,818

Claims priority, application United Kingdom, Apr. 29, 1982, 8212403

Int. Cl.⁴ G05F *1/58*

U.S. Cl. 323—276 **18 Claims**



1. A regulator circuit comprising:
an input terminal for receiving a D.C. input potential;
a transistor having an input electrode coupled to the input terminal and an output terminal for providing a regulated D.C. output potential;
an operational amplifier having a first input terminal, a second input terminal coupled to a reference potential line, and an output terminal;
a negative feedback path coupled between the output terminal of the operational amplifier and its first input terminal through said transistor as a control element; and
a second operational amplifier having a first input terminal

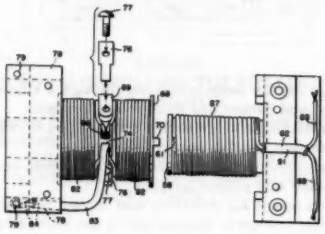
coupled to receive a D.C. signal representative of the D.C. input potential at said input terminal, a second input terminal coupled to said reference potential line and an output terminal coupled to control current flowing in a current path coupled to said output terminal of the regulator circuit, whereby the D.C. input potential appearing at the input terminal of the regulator circuit is regulated.

4,549,130

LOW LEAKAGE TRANSFORMERS FOR EFFICIENT LINE ISOLATION IN VHF SWITCHING POWER SUPPLIES

Edward A. Dobberstein, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1983, Ser. No. 513,205
Int. Cl.[4] H01F *27/38*
U.S. Cl. 323—308 **17 Claims**



1. A transformer suitable for VHF power conversion applications comprising:

a magnetizable material core assembly;

a telescopic bobbin assembly mountable on a pole portion of the core assembly, said bobbin assembly having inner and outer sections telescoping together and forming an interior clearance space between said sections and providing an isolated conduit from said interior clearance space to the outside of the bobbin assembly, said conduit being substantially parallel to the longitudinal axis of the bobbin assembly;

a first conductive lead coiled on the inner section of the bobbin assembly forming a primary winding having ends exiting from said bobbin assembly through said isolated conduit, said primary winding substantially occupying said interior clearance space;

a multi-turn tertiary winding coiled on the outer bobbin section; and

at least one secondary winding, each formed from a continuous sheet of conductive material, intimately encompassing the tertiary winding in a geometric configuration wherein the leakage inductance between said tertiary and said secondary windings is minimized and wherein the high-pot breakdown between said primary and secondary windings is at least 3750 VAC.

4,549,131

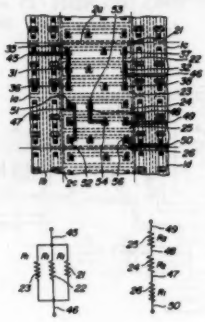
SEMICONDUCTOR DEVICE AND TECHNIQUE WHICH EMPLOYS NORMALLY UNUSED INTERCONNECTION ELEMENTS AS RESISTOR CIRCUIT ELEMENTS

Yoshimasa Kusazaki, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,834
Claims priority, application Japan, Dec. 26, 1981, 56-210607
Int. Cl.[4] H01L *27/00, 23/50*
U.S. Cl. 323—354 **15 Claims**

1. In a semiconductor device having a semiconductor body with a given conductivity type, a plurality of active cells formed in the body to define circuit elements, a plurality of wiring cells formed in the body, and means for interconnecting selected ones of the active cells to one another through selected ones of the wiring cells to define a circuit configuration, the improvement comprising:

a plurality of resistor elements, each resistor element being constructed by electrically interconnecting at least a portion of at least one of the non-selected wiring cells with at least a portion of at least another one of said non-selected



wiring cells to form a resistor element separate from the selected ones of said wiring cells, each of said wiring cells having a specific resistivity; and

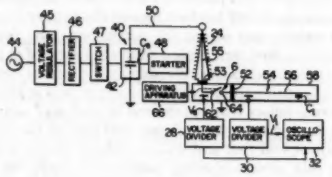
means for interconnecting said plurality of resistor elements to said active cells as separate resistive circuit elements of said circuit configuration.

4,549,132

METHOD OF TESTING AND VERIFYING A PERFORMANCE FOR INSULATION TO GROUND OF A DISCONNECTING SWITCH WHEN BREAKING A CHARGING CURRENT

Tokio Yamagiwa; Toshio Ishikawa; Jun Ozawa, all of Hitachi; Kaoru Endo, Ibaraki, and Masao Hosokawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,086
Claims priority, application Japan, Aug. 20, 1982, 57-143417
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—54 **9 Claims**



1. A method of testing insulation to ground for a disconnecting switch when breaking a charging current, said disconnecting switch having a movable electrode and a fixed electrode which are arranged in a tank so as to face each other, one of said electrodes being connected to an electrostatic capacity load and the other electrode being connected to a power supply, said test method comprising:

a first step of setting a distance between said movable and fixed electrodes to a selected distance value, generating an electrical potential with said power supply, said potential being of a predetermined magnitude associated with said selected distance value, applying said potential to said other electrodes to cause a discharge across both electrodes, thereby enabling charge to be accumulated and stored in the capacity of said load;

a second step of applying a pulsed electrical potential gener-

ated by said power supply to said other electrode, said pulsed potential being of opposite polarity to said stored charge in said load thereby causing a second discharge across both electrodes; and

a third step of verifying the satisfactory performance of the insulation to ground of said switch by monitoring said second discharge.

4,549,133
MEASURING ARRANGEMENT FOR CAPACITIVE SECURITY FENCES

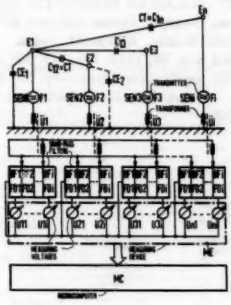
Uwe Metzner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,400

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222640

Int. Cl.⁴ G01R *11/52*

U.S. Cl. 324—60 R **11 Claims**



1. A measuring arrangement for a capacitive security fence which has a plurality of electrodes which have capacitances between the electrodes and self-capacitance for each electrode with respect to ground, comprising:

a plurality of transmitters connected to respective ones of at least some of the electrodes and operable at respective different frequencies;

a plurality of transformers each including a secondary, and a primary connecting a respective transmitter to ground;

a plurality of band-pass filters connected to said secondaries and having adjustable center frequencies corresponding to the frequencies of said transmitters; and

measuring means connected to said plurality of band-pass filters and operable to identify the capacitances and self-capacitances which are proportional to the voltages measured at the center frequencies of said plurality of band-pass filters.

4,549,134
MOISTURE PROBE AND TECHNIQUE

Thomas M. Weiss, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 475,998, Mar. 17, 1983, abandoned, which is a continuation of Ser. No. 886,853, Mar. 15, 1978, abandoned. This application Sep. 7, 1984, Ser. No. 648,902

Int. Cl.⁴ G01R *27/26*

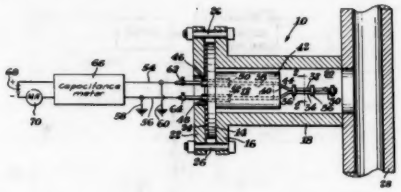
U.S. Cl. 324—61 R **29 Claims**

1. Apparatus for sensitivity detecting, quantitatively, a range of concentrations, particularly trace concentrations of water in diverse fluids of interest, with utility for quantitating in the low ppm range, comprising in combination:

a capacitance element comprising a pair of capacitor plates between which there is disposed a membrane;

said membrane comprising a sulfonated aliphatic fluorocarbon polymer, the capacitance element having the property to produce detectable capacitance change with changes in water concentration in air at least over the range of about 24,000 ppm to about 44 ppm;

means for impressing a voltage below the voltage level required for electrolysis from the first capacitor plate through the membrane to the second capacitor plate and



thereby causing a change in the capacitance of the membrane dependant upon the water concentration in the fluid of interest; and

means for detecting capacitance change of the capacitance element for purposes of determining the concentration of water in the fluid of interest.

4,549,135
MAGNETIC FIELD GRADIOMETER WITH TRIMMING ELEMENT

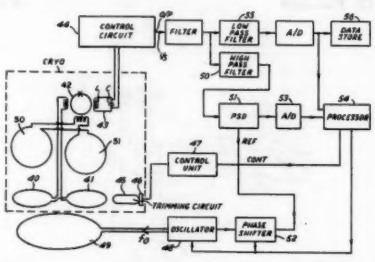
Ashok W. Vaidya, High Wycombe, England, assignor to EMI Limited, Hayes, England

Filed Jan. 3, 1983, Ser. No. 455,051

Claims priority, application United Kingdom, Feb. 16, 1982, 8204534

Int. Cl.⁴ G01R *33/035*

U.S. Cl. 324—248 **13 Claims**



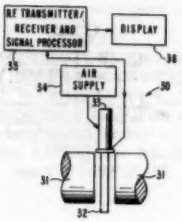
1. A magnetic field gradiometer comprising a coil arrangement including a first coil encompassing a first region of space and a counterwound second coil, connected in series with the first coil, encompassing a second region of space, a superconducting detection device coupled to the coil arrangement to generate an electrical output signal representative of a difference of magnetic flux prevailing in the first and second regions of space,

a trimming element, formed of a superconducting material, and occupying a fixed position in relation to the first and second coils and having means for varying controllably the proportion of said element assuming the superconducting state thereby to regulate the relative amounts of magnetic flux linking the first and second coils.

4,549,136
CONTROLLED SUSCEPTIBILITY PLUGS

Albert P. Zens, Fremont, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 7, 1983, Ser. No. 482,344
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—308 6 Claims

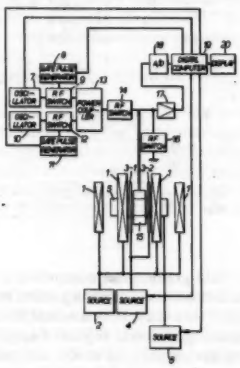


1. The method for improving the sensitivity of magnetic resonance analysis of a sample distributed in a solvent, comprising (a) selecting an inert material having substantially similar magnetic susceptibility to the magnetic susceptibility of said solvent, (b) constructing from said material at least two cylindrical bodies for insertion into a cylindrical sample tube one said body forming one end of an open container for holding said solvent and sample, (c) placing said sample in said sample tube above said first body and inserting another said body in said sample tube above and substantially contacting said sample to close said sample tube, (d) magnetically analyzing said sample in said closed sample tube.

4,549,137
NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

Hirokazu Suzuki, and Kozo Satoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 21, 1983, Ser. No. 506,290
Claims priority, application Japan, Jun. 21, 1982, 57-106501
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—309 4 Claims



1. Nuclear magnetic resonance diagnostic apparatus for producing the density distribution image of specified atomic nuclei in a slice of an object by image resonstruction procedure on projection data of the specified atomic nuclei density distribution which are achieved in a variety of directions in the plane of said slice of said object by using nuclear magnetic resonance phenomena, the apparatus comprising:

means for applying a gradient magnetic field to form an equivalent plane in the magnetic field corresponding to said slice in the predetermined region to be measured, so as to obtain said projection data;

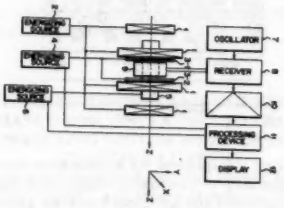
means for selectively saturating magnetization vectors in the entire region other than the region corresponding to said slice in the region to be measured by applying radio frequency waves which are composed of continuous waves the frequency of which is successively varied in a range not inclusive of the resonance frequency of the specific atomic nuclei; and

means for obtaining the projection data in the predetermined directions in said slice by measuring the resonance signals by applying 90° pulses of resonance frequency of said specified atomic nuclei to the measurable region including the equivalent magnetic field plane region, while said saturation state of magnetization vectors is maintained.

4,549,138
APPARATUS AND METHOD FOR EXAMINING AN OBJECT BY NUCLEAR MAGNETIC RESONANCE

Masaharu Suzuki, Nagoya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1983, Ser. No. 536,452
Claims priority, application Japan, Sep. 30, 1982, 57-171877
Int. Cl.[4] G01N *24/06*
U.S. Cl. 324—309 15 Claims



1. An apparatus for examining an object having a longitudinal axis and a cross-sectional slice perpendicular thereof, by nuclear magnetic resonance, comprising:

magnet means for applying to said object a steady magnetic field along said longitudinal axis;

first coil means, which is arranged along said longitudinal axis, for applying to said object a first gradient field, which in conjunction with said steady field provides a predetermined field in said cross-sectional slice of said object, the field direction of said first gradient field being parallel to that of said steady magnetic field and the absolute value of the field strength of said first gradient field increasing linearly in opposite directions from said cross-sectional slice along said longitudinal axis;

probe head coil means for (a) applying RF pulses to said cross-sectional slice in a direction perpendicular to said longitudinal axis so as to excite nuclei therein which are being subjected to said predetermined field, said RF pulses having a generation period, and (b) for detecting nuclear magnetic resonance signals, having duration times and phase information, derived from said cross-sectional slice;

second coil means for applying a second gradient field to said cross-sectional slice so as to define a projection angle of said nuclear magnetic resonance signals, the field direction of said second gradient field being perpendicular to said steady magnetic field and the strength of said second gradient field varying linearly, orthogonal to said first gradient field;

processing means for receiving said nuclear magnetic resonance signals from said probe head means, and for processing said duration times and phase information by use of a two-dimensional Fourier transformation to produce an image of said cross-sectional slice; and

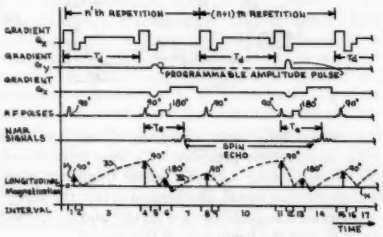
oscillating circuitry, connected to said processing means, including (a) means for generating said RF pulses, (b) means for amplifying said RF pulses, said amplifying means having at least two different operating modes, and (c) bias control means for controlling said operating modes during and after said RF pulse generation period.

4,549,139

METHOD OF ACCURATE AND RAPID NMR IMAGING OF COMPUTED T_1 AND SPIN DENSITY

James R. MacFall, Hartland, and Felix W. Wehrli, Shorewood, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jun. 3, 1983, Ser. No. 500,665
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—309 **12 Claims**



1. An NMR method of imaging a predetermined region of a sample positioned in a homogeneous magnetic field so as to produce a net longitudinal magnetization in said region, which method comprises.

subjecting said predetermined region, in the course of a complete scan to obtain data to image said region, to a plurality of repetitions of a sequence composed of rotating magnetic field and magnetic-field-gradient pulses, each repetition of said sequence including at least one step of reducing said longitudinal magnetization to substantially zero;

allowing said longitudinal magnetization to recover along the direction of said homogeneous magnetic field for a recovery time T_d;

exciting nuclear spins in said predetermined region so as to produce at least one NMR spin-echo signal due primarily to said recovered longitudinal magnetization; and

sampling said spin-echo signal in the presence of at least one magnetic-field gradient for encoding spatial information into said spin-echo signals.

4,549,140

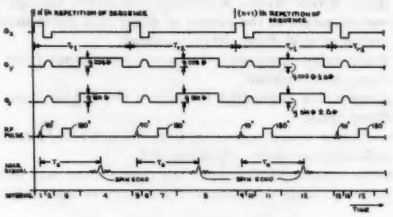
METHOD UTILIZING COMBINED, INTERLEAVED PULSE SEQUENCES FOR REDUCING MOTION ARTIFACTS IN COMPUTED T_1,T_2 AND M_0 NMR IMAGING

James R. MacFall, Hartland, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Jun. 3, 1983, Ser. No. 500,666
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—309 **9 Claims**

1. An NMR method of imaging a predetermined region of a sample positioned in a homogeneous magnetic field, which method comprises:

subjecting said predetermined region, in the course of a complete scan to obtain imaging data to image said region, to a plurality of repetitions of a sequence composed of rotating magnetic field and magnetic-field-gradient pulses, each repetition of said sequence including at least two steps of exciting nuclear spins in said region so as to produce a corresponding number of NMR signals, said steps of exciting being separated by a sequence repetition time T_r; and



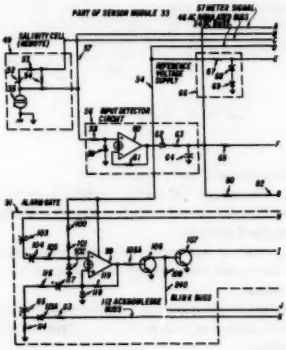
sampling each of said NMR signals in the presence of at least one magnetic-field gradient for encoding spatial information into said NMR signals to obtain said imaging data, wherein each repetition of said sequence includes at least two different T_r times, such that said NMR signals are sampled at approximately the same average time relative to any motion of said sample.

4,549,141

SALINITY INDICATOR SYSTEM

Horace A. Teass, Jr., 25 Mead Rd., Armonk, N.Y. 10504

Filed Sep. 29, 1982, Ser. No. 427,696
Int. Cl.[4] G01R *27/22*
U.S. Cl. 324—441 **16 Claims**



1. A salinity indicator system for monitoring and indicating the salinity of a water source comprising:

a salinity cell adapted to sense changes in the salinity of the said water,

a regulated A.C. source of voltage for application to said salinity cell,

an input detector circuit connected to receive the salinity signal generated by said salinity cell,

an alarm detector circuit connected to receive the output from said input detector circuit,

a dump detector circuit connected to receive the output from said input detector circuit,

an alarm driver circuit connected to receive the output from said alarm detector circuit, an alarm relay connected to receive the output from said alarm driver circuit,

a bell driver circuit connected to receive the output from said alarm relay,

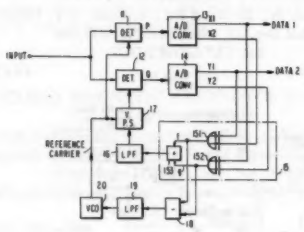
a bell relay connected to receive the output from said bell driver circuit,
an alarm bell connected to receive the output from said bell relay,
switch means capable of being selectively connected to the output of said alarm detector circuit or said dump detector circuit,
a dump driver circuit selectively connected through said switch means to the output of either said alarm detector circuit or said dump detector circuit,
a dump relay connected to receive the output from said dump driver circuit,
a dump valve connected to receive the output from said dump relay,
an indicator circuit connected to said alarm relay circuit for indicating an alarm condition, and
a meter connected to receive the output from said salinity cell to provide a reading of the salinity of said water.

4,549,142

PHASE DEMODULATOR INCLUDING VARIABLE PHASE SHIFTER FOR CONTROLLING REFERENCE CARRIER

Yasuharu Yoshida, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,199
Claims priority, application Japan, Oct. 30, 1982, 57-190029
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—50 **2 Claims**



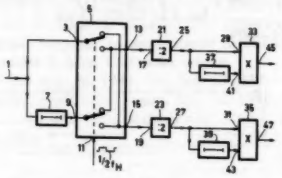
1. A phase demodulator comprising:
a first detector means for phase-detecting an input digital-signal-modulated carrier wave with a reference carrier wave supplied thereto;
a variable phase shifter means for receiving said reference carrier wave and controlling its phase in response to a control signal;
a second phase detector means for phase-detecting said input modulated carrier waves with the output of said variable phase shifter;
means for recovering said reference carrier wave;
multilevel discriminator means for multilevel discriminating outputs of said first and second detectors, said multilevel discriminator means comprising analog-to-digital (A/D) conversion means for receiving outputs of said first and second phase detector means and for providing corresponding first and second multi-bit digital signals, at least a portion of each multi-bit digital signal generated from each phase detector output representing demodulated data; and
logic means for logically processing the output of the discriminator means and providing an orthogonality error signal as said control signal, said logic means comprising a first Exclusive OR (EOR) gate for receiving and combining selected bits from each of said multi-bit A/D converter output signals, a second EOR gate for receiving and combining different selected bits from each of said multi-bit A/D converter output signals, an adder means for adding the outputs of said first and second EOR gates to obtain said control signal.

4,549,143

F.M. DEMODULATOR WITH WAVEFORM CORRECTION CIRCUIT

Maurice Bouland, Rueil Malmaison, France; Wilhelmus A. J. Van Gurp, and Wilhelmus A. J. M. Zwijsen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,179
Claims priority, application Netherlands, Jul. 7, 1983, 8302423
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—126 **1 Claim**



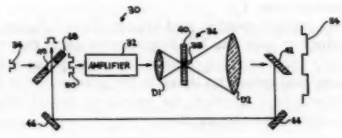
1. F.M. demodulator with waveform circuit comprising a tuned F.M. demodulator preceded by a waveform correction circuit for demodulating a carrier whose frequency is modulated by a modulating signal, chacterized in that the waveform correction circuit is a divide-by-two divider and the demodulator is tuned to half the frequency of the carrier.

4,549,144

REFLEX RING LASER AMPLIFIER SYSTEM

Mark A. Summers, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1983, Ser. No. 528,285
Int. Cl.[4] H01S *3/081, 3/083*
U.S. Cl. 330—4.3 **22 Claims**



1. An unstable ring resonator laser amplifier system for amplifying an input laser pulse, comprising:
a large-aperture laser amplifier having an input aperture to which the input laser pulse is injected for amplification by said laser amplifier and having an output aperture at which an amplified laser pulse is produced;
means, optically aligned with the amplifier, for spatially filtering and expanding the laser pulse;
means for recirculating the laser pulse through the amplifier to produce an expanded amplified laser pulse, successive pulses passing through concentric non-overlapping regions of the gain medium on each successive pass;
means for coupling the expanded amplified laser pulse out of the unstable resonator when the laser pulse has reached a predetermined spatial extent.

4,549,145

SWITCHING AMPLIFIER

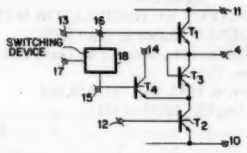
Rudy J. van de Plassche, Sunnyvale, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,140

Claims priority, application Netherlands, Oct. 18, 1982, 8204003

Int. Cl.⁴ H03F *1/08, 3/30*

U.S. Cl. 330—51 **12 Claims**



1. A switching amplifier having an input and an output, and means for inhibiting current flow in the output in such a way that the output is isolated from the input and assumes a high-impedance state, characterized in that the amplifier includes an output stage comprising a first and a second transistor of a first conductivity type, whose main current paths are arranged in series between power-supply terminals, the emitter of the first transistor being connected to the collector of the second transistor and to the output, and the collector of the second transistor and the base of the first transistor being coupled to the input of the amplifier; and said inhibiting means comprises a first semi-conductor junction coupling the collector of said second transistor to the output and which has a forward direction corresponding to the collector-current direction of the second transistor, and a switching device coupled to the base of said first transistor and the collector of said second transistor which, in response to a switching signal, changes the direction voltages on the base of the first transistor and on a point between said first semiconductor and the collector of the second transistor relative to the voltage on the output in such a way that the first transistor and the first semiconductor junction are turned off, the switching device carrying the collector current of the second transistor at least initially when the semiconductor junction is turned off, so that initially the second transistor can remain conductive.

4,549,146

SYSTEMS AND METHODS FOR COMPENSATING FOR ELEMENT NONLINEARITIES IN ELECTRONIC CIRCUITS

Kenneth W. Cowans, 17520 Greenleaf St., Encino, Calif. 91316, and M. Owen Bennett, 5913 Etiwanda Ave. #7, Tarzana, Calif. 91356

Filed Jun. 6, 1983, Ser. No. 501,194

Int. Cl.⁴ H03F *1/26*

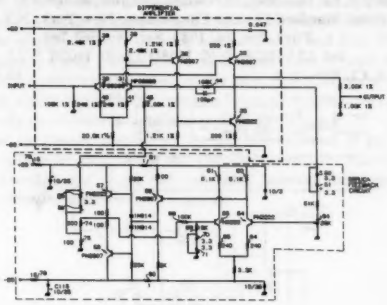
U.S. Cl. 330—149 **10 Claims**

4. A system for compensating to its original form a complex multifrequency input signal waveform that is processed in a pre-existing active electrical reproduction device which exhibits the effect of distorting the waveform in an immeasurably small manner due to signal and power supply induced parametric variations within that pre-existing device comprising:

means including a set of active and passive devices for replicating in a feedback path the signal and power supply induced parametric variations of the pre-existing device such that the feedback signal contains the immeasurably small distortion due to signal and power supply induced parametric variations;

means for receiving and comparing in a differential manner the input signal waveform to the waveform from the replica feedback circuit to derive a difference signal waveform; and

means defining a feedforward path and including means responsive to the difference signal waveform and in circuit with the pre-existing active electrical reproduction



device to generate an output signal waveform which is substantially restored to its original waveform state.

4,549,147

LOAD IMPEDANCE DETECTOR FOR AUDIO POWER AMPLIFIERS

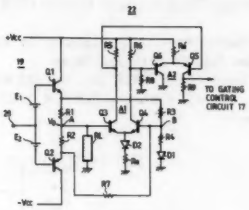
Hikaru Kondo, Zama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 31, 1983, Ser. No. 480,927

Claims priority, application Japan, Apr. 1, 1982, 57-47179[U]; Jun. 17, 1982, 57-90459[U]; Sep. 20, 1982, 57-142416[U]

Int. Cl.⁴ H03F *3/26*

U.S. Cl. 330—297 **14 Claims**



1. A load impedance detector for detecting a variation of the impedance of a load in a single-ended push-pull amplifier having a pair of first and second transistors of opposite conductivity types, said transistors having emitters interconnected by a pair of series-connected first and second resistors, said load being connected to a first node between said first and second resistors, comprising:

third and fourth resistors connected in series to the emitter of said first transistor, said third and fourth resistors defining a second node therebetween; and

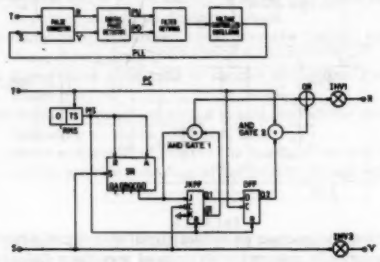
differential means coupled to said first and second nodes to form a bridge circuit when said first, third and fourth resistors and said load, the differential means being operative only when the potential across said load exceeds a predetermined threshold for detecting a voltage difference between said first and second nodes and generating therefrom an output signal in response to said detected voltage difference being higher than a predetermined value.

4,549,148

PULSE CORRECTOR FOR PHASE COMPARATOR INPUTS

Marc E. M. Hoefman, St.Niklaas, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 561,764
Int. Cl.[4] H03L *7/10*; H03D *13/00*; H03K *5/22*
U.S. Cl. 331—1 A **11 Claims**



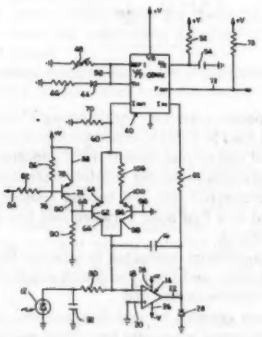
1. Pulse corrector which in response to first and second input pulses applied to its first and second inputs provides first and second output pulses at its first and second outputs respectively, the first pulse edge occurring at said first output after an interruption of said first input pulses never leading the corresponding first pulse edge occurring at said second output irrespective of the phase relationship between the corresponding first pulse edges occurring at said inputs after said interruption, characterized in that the duration of the pulse (TL) produced at said first output, and starting with said first pulse edge occurring at said first output after said interruption is not substantially less than that of one (S4) of said first (T) and second (S) input pulses.

4,549,149

CURRENT TO FREQUENCY CONVERTER SWITCHED TO INCREASED FREQUENCY WHEN CURRENT INPUT LOW

John K. Michalik, Sloan, N.Y., assignor to Warner-Lambert Technologies, Inc., Southbridge, Mass.

Filed Apr. 8, 1983, Ser. No. 483,408
Int. Cl.[4] G01J *5/22*; H03K *3/02*
U.S. Cl. 331—66 **6 Claims**



1. In a current to frequency converter comprising a current source, a voltage to frequency converter, an integrator in the feedback loop of said voltage to frequency converter, said current source being connected to a summing junction connected to said voltage to frequency converter and to said integrator such that the frequency of output pulses from said voltage to frequency converter is directly proportional to a magnitude of current injected from said source and inversely proportional to a magnitude of current injected from said voltage to frequency converter to the summing junction, the improvement comprising:

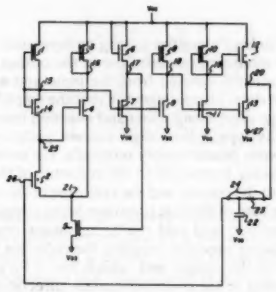
controlled means for attenuating the current injected from said voltage to frequency converter to the summing junction to increase the frequency of output pulses.

4,549,150

PUSH PULL OUTPUT RC OSCILLATOR WITH FREQUENCY COMPENSATION

Arthur B. Oliver, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1982, Ser. No. 439,162
Int. Cl.[4] H03L *1/00*
U.S. Cl. 331—111 **3 Claims**



1. An oscillator circuit comprising:

a Schmidt trigger circuit connected to receive an input signal and generating an output;

a push-pull driver circuit receiving said output of said Schmidt trigger circuit for providing an output signal for said oscillator circuit;

an external timing circuit connected to said Schmidt trigger circuit and said push-pull driver circuit for receiving said output signal and providing said input signal;

a first compensating means connected to said Schmidt trigger circuit for determining the low voltage trigger point of said Schmidt trigger circuit, lowering the low voltage trigger point of said Schmidt trigger circuit in response to an increase in the supply voltage and vice versa; and

a second compensating means connected to said Schmidt trigger circuit for determining the high voltage trigger point of said Schmidt trigger circuit, raising the high voltage trigger point of said Schmidt trigger circuit in response an increase in the supply voltage and vice versa, whereby the frequency of oscillation of said oscillator circuit is stabalized with respect to variations in supply voltage.

4,549,151

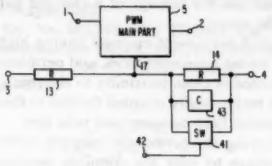
PULSE WIDTH MODULATOR CIRCUIT WITH THERMAL BREAKDOWN PREVENTION

Takashi Kaneko, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,775
Claims priority, application Japan, Jul. 24, 1981, 56-116629
Int. Cl.[4] H03K *7/08*
U.S. Cl. 332—9 R **13 Claims**

12. A pulse width modulator (PWM) circuit of the type having: an input terminal for receiving an input; a reference terminal for receiving a reference potential; and voltage division means including at least a first impedance element and a capacitance element coupled in parallel with each other and

coupled in series between said reference terminal and a lower potential and a second impedance element coupled in series between said reference terminal and a higher potential, said PWM providing a signal which is pulse width modulated in



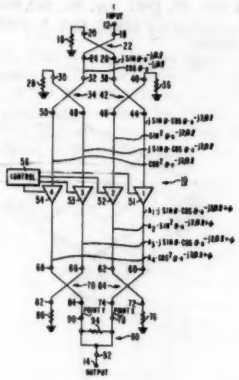
accordance with said input signal and having a maximum pulse width limited by said reference potential, the improvement comprising an ON/OFF switch means for changing exclusively said reference potential in response to a switch control signal to thereby eliminate said pulse width modulated signal.

4,549,152

BROADBAND ADJUSTABLE PHASE MODULATION CIRCUIT

Mahesh Kumar, Dayton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,452
Int. Cl.⁴ H03C *3/00*
U.S. Cl. 332—23 R **7 Claims**



1. A phase modulation circuit connected between an input terminal and output terminal comprising in combination:

first, second, third, fourth and fifth 90° couplers each having a pair of input ports and a pair of output ports;

first, second, third and fourth adjustable gain amplifiers each having a control terminal, an input port and an output port;

an in-phase combiner having an output port coupled to said output terminal and a pair of input ports;

the input ports of said first 90° coupler being connected to said input terminal and a terminating impedance respectively, one of the pair of output ports thereof and a terminating impedance being connected respectively to the respective input ports of said second 90° coupler, the other of the pair of output ports of said first 90° coupler and a terminating impedance being connected respectively to the respective input ports of said third 90° coupler,

the output ports of said second 90° coupler being connected to the input ports of said first and second amplifiers respectively, the output ports of said third 90° coupler being connected to the input ports of said third and fourth amplifiers respectively, the output ports of said first and second amplifiers being connected respectively to the input ports of said fourth 90° coupler, the output ports of said third and fourth amplifiers being connected respectively to the input ports of said fifth 90° coupler, one of the pair of output ports of each of said fourth and fifth 90° couplers being connected to said input ports of said in-phase combiner, the other of the pair of output ports of said fourth and fifth 90° couplers being connected respectively to respective terminating impedances; and

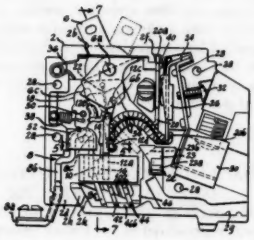
a control means coupled to the control terminal of each amplifier for controlling the gain thereof and for thereby controlling the phase shift of signal between said input terminal and said output terminal.

4,549,153

RESIDENTIAL CIRCUIT BREAKER WITH SLOT MOTOR

Kenneth A. Forsell, Port Washington, and Peter J. Theisen, West Bend, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,949
Int. Cl.⁴ H01H *77/10*
U.S. Cl. 335—16 **4 Claims**



1. A residential or commerical circuit breaker having a narrow case of width less than or equal to about one inch, and having a pair of separable contacts mounted on respective current carrying conductors, and comprising magnetically permeable slot motor means mounted within said case and around both said conductors,

wherein:

said conductors extend parallel to each other in said slot motor means;

said case has an end wall through which an operating handle extends;

said contacts engage along a plane substantially perpendicular to said handle end wall;

said slot motor means has a U-shaped configuration and receives both said conductors therein from one side, one of said conductors being movable toward the open end of the U away from the bight of the U;

said bight of said U-shaped slot motor means extends substantially parallel to said plane of contact engagement and substantially perpendicular to said handle end wall.

4,549,154

MAGNETICALLY RETENTIVE PROGRAMMABLE SWITCHING CONTROL DEVICE

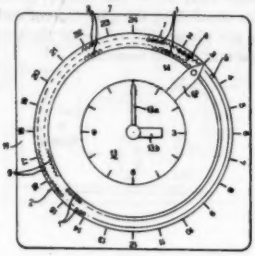
Friedrich X. Thoma, Haslach, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Continuation of Ser. No. 452,726, Dec. 23, 1982, abandoned. This application Jan. 9, 1985, Ser. No. 689,516

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148702

Int. Cl.[4] H01H *43/00*; **G05B** *19/06*; **G04C** *23/00, 21/00*

U.S. Cl. 335—87 **29 Claims**



1. A programmable switching control device for use in combination with a sensing means, said control device comprising:

a program carrier;

said program carrier having a plurality of outwardly extending control fingers consisting at least in part of ferromagnetic material, said control fingers having movable free ends individually displaceable by a programmer to a position in a sensing zone of said sensing means for actuating said sensing means in accordance with a program; and

a magnetic means disposed adjacent to said free ends such that at least said free ends are within a magnetic field generated by said magnetic means for magnetically retaining a control finger free end in a displaced programmed position, said control finger being mechanically displaceable away from said magnetic means to a non-programmed position.

4,549,155

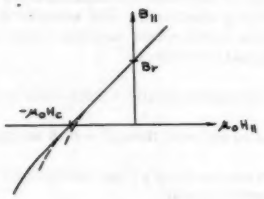
PERMANENT MAGNET MULTIPOLE WITH ADJUSTABLE STRENGTH

Klaus Halbach, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,433

Int. Cl.[4] H01F *1/00*

U.S. Cl. 335—212 **9 Claims**



1. A multipole permanent magnet structure for guiding, focusing and turning charged particle beams, said structure having an adjustable field strength and a substantially constant magnetic field distribution, comprising:

a first pole piece and a second pole piece, each formed of magnetically-soft material, each pole piece having a pole tip, said pole pieces being spaced-apart to permit a magnetic field to be established between the pole tips, said pole pieces being arranged about a longitudinal axis to provide a cylindrical multipole structure having a central space formed between the pole tips and extending along the longitudinal axis for passage of a charged particle beam through the space;

first and second permanent magnets having high remanent fields and strong coercive forces, said permanent magnets being mounted in close proximity to the rear of said pole pieces and magnetically coupled thereto to thereby establish a magnetic field between said pole tips;

means for moving the permanent magnets with respect to the pole pieces to vary the coupling between the pole pieces and the permanent magnets so that the flux denisity of the magnetic field between the pole tips is correspondingly varied, while the magnetic field distribution between the pole tips is maintained substantially constant.

4,549,156

SUPERCONDUCTING MAGNET

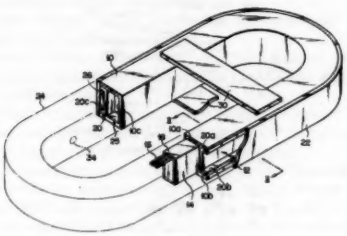
Susumu Mine, Zushi, and Takao Ishizaka, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 31, 1982, Ser. No. 363,888

Claims priority, application Japan, Oct. 8, 1981, 56-160523; Dec. 4, 1981, 56-194430

Int. Cl.[4] H01F *7/22*

U.S. Cl. 335—216 **16 Claims**



1. A superconducting magnet comprising:

(a) a coil structure including a superconducting wire which is wound a predetermined number of turns into the form of a closed loop with a rectangular profile and which is impregnated with a hardenable material;

(b) annular vessel means for accommodating said coil structure in an inner space thereof and for isolating said coil structure from atmospheric conditions; and

(c) coil holding means, rigidly mounted within said vessel means to extend in an annular form through said inner space, including a wall for dividing the inner space into a first annular space dimensioned substantially identical with said coil structure in shape and size and a second annular space defining a coolant path, and for stably sealing the coil structure within the first annular space such that the wall makes a continual area-to-area contact with the coil structure, thereby preventing generation of friction heat between the coil structure and the coil holding means which causes the coil quench phenomenon, i.e., change from the superconducting state to the normal state.

4,549,157

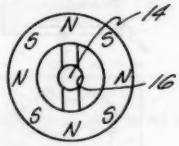
PLASTIC BONDED MAGNET WITH CIRCUMFERENTIALLY SPACED POLES HAVING SUBSTANTIALLY UNIFORM MAGNETIC PROPERTIES

Robert J. Loubier, Fort Wayne, Ind., assignor to Xolox Corporation, Fort Wayne, Ind.

Division of Ser. No. 382,391, May 27, 1982, Pat. No. 4,496,303. This application Dec. 8, 1983, Ser. No. 559,493

Int. Cl.⁴ H01F *7/02*

U.S. Cl. 335—303 **4 Claims**



1. A body of magnetizable material which includes a solidified mixture of thermoplastic powder and magnetic particles capable of being permanently magnetized, said body having opposite ends and an axis of symmetry between said ends, said particles being substantially uniformly dispersed throughout said body in coaxial sections extending between said axis and the body periphery, and said body having magnetic poles circumferentially spaced about said axis which have substantially uniform magnetic properties.

4,549,158

INDUCTANCE ELEMENT

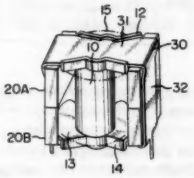
Tadashi Mitsui, Tokyo, and Masaru Wasaki, Chiba, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 306,886, Sep. 30, 1981, abandoned, which is a continuation of Ser. No. 91,783, Nov. 6, 1979, abandoned. This application Nov. 28, 1984, Ser. No. 675,468

Claims priority, application Japan, Nov. 9, 1978, 53-153501[U]; Nov. 9, 1978, 53-153502[U]

Int. Cl.⁴ H01F *15/02, 27/30*

U.S. Cl. 336—83 **6 Claims**



1. An inductance element comprising: a pair of pot cores, each pot core comprising a cylindrical slug and opposed shells spaced from and partially surrounding said slug, each of said opposed shells being joined to said slug at an end of said slug by a disc portion that partially circumferentially extends about said slug, a coil bobbin comprising a hollow cylindrical member with opposed flanges at each end thereof extending generally perpendicular to the longitudinal axis of said cylindrical member and outwardly from the external surface of said cylindrical member, each of said flanges extending partially circumferentially about said cylindrical member along a first arc thereof and mating with a corresponding one of said disc portions, said flanges at one end of said coil bobbin each including a joining part extending away therefrom which engages with and interfits with a corresponding one of said pot cores, said joining parts each including a stepped part at a level spaced from that of said flange to which it is joined, said stepped parts having portions thereof that extend about said cylindrical member along second arcs thereof different from said first arcs, said stepped part carrying connectors for making electrical connection to the inductance element, and a fastening member extending at least partially about said pot cores for joining together said pot cores and coil bobbin.

4,549,159

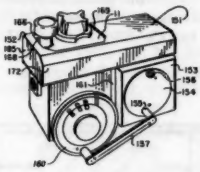
THERMOSTAT CONTROL APPARATUS

James B. McGhee, El Cajon, and Thomas D. Tweedie, Monrovia, both of Calif., assignors to Leslie C. Hill, San Diego, Calif.

Filed May 7, 1984, Ser. No. 607,802

Int. Cl.⁴ H01H *37/62*

U.S. Cl. 337—301 **12 Claims**



1. Apparatus for controlling a thermostat, said thermostat having a control box and an externally accessible, rotatable control element, said apparatus comprising:

a unitary housing comprising:

a mounting bracket adapted to removably slide over and at least partially enclose said thermostat control box; and

a controller housing;

a motor in said controller housing having an externally accessible shaft;

crank means mounted to said shaft for rotation therewith;

drive means engaging the thermostat control element; and

an elongated drive arm removably and rotatably coupled at one end to said crank means and to the other end to said drive means, whereby rotation of said crank means changes the setting of the thermostat.

4,549,160

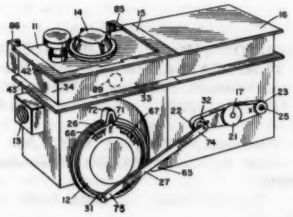
THERMOSTAT CONTROL APPARATUS

James B. McGhee, El Cajon, Calif., assignor to Leslie C. Hill, San Diego, Calif.

Filed Jul. 27, 1983, Ser. No. 517,725

Int. Cl.⁴ H01H *37/62*

U.S. Cl. 337—301 **53 Claims**



1. Apparatus for controlling a thermostat, said thermostat having a control box and an externally accessible, rotatable control element, said apparatus comprising:

a mounting bracket adapted to removably slide over and at least partially enclose said thermostat control box;

a controller housing connected to said mounting bracket;

a motor in said housing having an externally accessible shaft;

crank means mounted to said shaft for rotation therewith;

drive means comprising the thermostat control element; and

an elongated drive arm removably and rotatably coupled at one end to said crank means and at the other end to said drive means, whereby rotation of said crank means changes the setting of the thermostat.

4,549,161

PTC CIRCUIT PROTECTION DEVICE

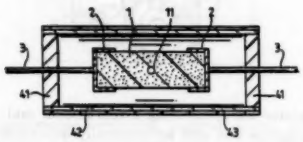
Mary S. McTavish, Fremont; Robert W. Stodieck, Palo Alto, and Frank A. Doljack, Pleasanton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 349,505, Feb. 17, 1982, Pat. No. 4,481,498. This application Jul. 23, 1984, Ser. No. 633,177

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.⁴ H01C *1/00, 7/02*

U.S. Cl. 338—20 **10 Claims**



1. A circuit protection device which has a resistance of less than 1000 ohms and which comprises

(1) a PTC element which

(a) is composed of a PTC conductive polymer composition which has a resistivity at 23° C. of less than 100 ohm.cm and which comprises a polymeric component and, dispersed in the polymeric component, a particulate conductive filler comprising carbon black; and

(b) is in the form of a strip with substantially planar parallel ends, the length of the strip being greater than the largest cross-sectional dimension of the strip;

(2) two electrodes, each in the form of a cap having (i) a substantially planar end which contacts and has substantially the same cross-section as one end of the PTC element and (ii) a side wall which contacts the side of the PTC element, and

(3) an enclosure

(a) which encloses and is spaced apart from at least the potential erosion zone of the PTC element; and

(b) which is substantially imperious to carbon dust;

whereby the adverse effects of carbonaceous dust evolved by the PTC element when it is tripped are minimized.

4,549,162

INSULATING HOUSING FOR A SURFACE TEMPERATURE THERMOMETER

Dieter Grimm, Schoneck, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 30, 1983, Ser. No. 567,347

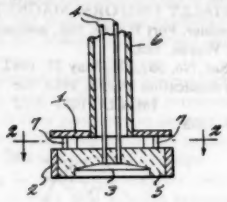
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 8317881[U]

Int. Cl.⁴ G01K *1/08;* H01C *7/00*

U.S. Cl. 338—28 **2 Claims**

1. In a rapidly responding electric thermometer for the measurement of surface temperature including a housing having a first portion with said first portion having a temperature sensor located in a recess in said first portion and said first portion being constructed from a poor heat conducting material,

said housing having a second portion through which lines for said temperature sensor extend, said second portion being insulated from heat transfer from said first portion by slits formed in said housing with said slits isolating said



portions except for at least two bridges connecting said portions.

4,549,163

SLIP INDICATING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

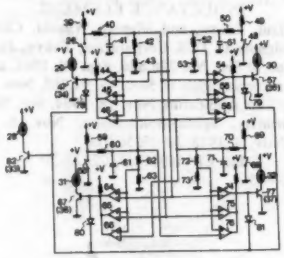
Tetsuo Satoh, Ohta; Masaaki Ohgami, Musashino, and Shoji Ogata, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,342

Claims priority, application Japan, Nov. 25, 1980, 55-166226

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—52 R **8 Claims**



1. In an indicating system for a four wheel motor vehicle having axle shafts respectively connected with the wheels of said vehicle, the improvement comprising

a plurality of speed detecting means, one of which is operatively mounted with respect to one each of said axle shafts for detecting speed of an associated wheel and providing a speed signal representative of the detected speed,

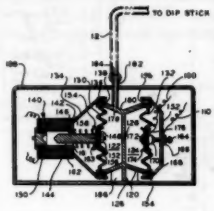
a plurality of comparing circuit means, each of said comparing circuit means being individually connected with an associated one of said speed detecting means for comparing the speed signal of said associated speed detecting means separately with the speed signals from each of all of the others of said speed detecting means and for generating an output signal when the speed of the associated wheel of the vehicle is higher than the speed of at least one of the other wheels, and

a plurality of slipping wheel indicating means, each of said slipping wheel indicating means being individually associated with an associated one wheel so as to be recognizable to an occupant of the vehicle as associated with the said associated one wheel and being individually connected with an associated one of said comparing circuit means for indicating a slipping of said associated wheel in response to said output signal of said associated comparing circuit means.

4,549,164
LIQUID VOLUME INDICATOR

Farouk F. Tewfik, 6000 Goldenrod Dr., Reno, Nev. 89511

Continuation-in-part of Ser. No. 29,978, Apr. 16, 1979, Pat. No. 4,417,232. This application Mar. 15, 1982, Ser. No. 358,442
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.[4] B60Q *1/00*; G01F *23/00*
U.S. Cl. 340—59 15 Claims



1. A device for indicating whether or not a predetermined minimum amount of liquid is in a vessel, such as the crank case of an automobile, comprising:

(a) a housing having therein at least a first chamber;

(b) a first flexible housing wall for changing the volume of said first chamber;

(c) a second flexible housing wall;

(d) a conduit coupled to said first chamber and in communication with said vessel;

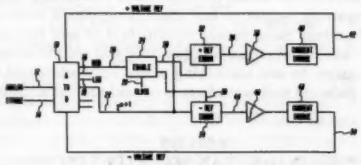
(e) moving means for moving said first flexible wall from a quiescent position so as to expand said volume of said first chamber; upon said expansion the drop in fluid pressure is communicated to said conduit and said second flexible housing wall; if there is the minimum amount of liquid present in the vessel, and said conduit receives therein the liquid, said second flexible wall moves from a quiescent position; if there is an absence of the minimum amount of the liquid, said second flexible wall remains substantially in its quiescent position; and

(f) indicating means, coupled to said second flexible wall, for providing an indication of said positions of said second flexible wall to thereby give an indication of the presence or absence of the minimum amount of liquid.

4,549,165
DYNAMIC VOLTAGE REFERENCE APPARATUS FOR A/D CONVERTERS

Michael Brian, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1984, Ser. No. 623,737
Int. Cl.[4] G08C *9/00*
U.S. Cl. 340—347 CC 8 Claims



1. Dynamic voltage reference apparatus comprising, in combination:

analog-to-digital (A/D) conversion first means, including signal input means, positive and negative voltage reference source means and digital word output means, for detecting analog signal input amplitude values with respect to a predetermined reference level;

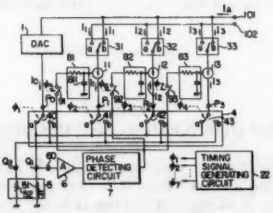
logic circuit second means, connected to said word output means of said first means for receiving error bit and most significant bit (msb) signals therefrom, for supplying positive and negative feedback signals from output means thereof; and

reference voltage third means, connected between said first and second means, for integrating the feedback signals and adjusting the positive and negative voltage levels of reference signals applied to said first means toward a value which minimizes the average value of said feedback signals.

4,549,166
DIGITAL-TO-ANALOG CONVERTER USING A FEEDBACK ELEMENT MATCHING TECHNIQUE

Masao Hotta, Hachioji; Kenji Maio, Tokyo, and Hiromi Nagashi, Nagasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,437
Claims priority, application Japan, Mar. 25, 1981, 56-42312; Feb. 3, 1982, 57-14987; Feb. 3, 1982, 57-14988
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 4 Claims



1. A digital-to-analog converter comprising a digital-to-analog converting means for converting predetermined lower bits of a digital input signal into an analog current which has an additional output, the current thereof being fixed to a reference value, n ($n \geqq 1$) numbers of current sources designated depending on the digital input signal of which said predetermined lower bits are removed, means for setting the output current value of at least one of said current sources by comparing the output current values with said reference value of said additional output so that the value is equal to a predetermined magnitude which is twice the value of a current controlled by the most significant bit at said digital-to-analog converting means, and means for adding the output current of said current source designated by said digital input signal and the output current of said digital-to-analog converting means to produce the analog signal corresponding to said digital input signal,

wherein said setting means comprises control means for generating a control signal depending on the difference between the respective output current values of said current sources and said maximum value so that the respective output current values of said current sources become equal to said maximum value sequentially and supplying said current sources with said control signal,

wherein said control means comprises current detecting means for alternately detecting the respective output current value of said n numbers of current sources and said maximum value and means for detecting a low frequency component of the output of said current detecting means, the output of which is said control signal,

wherein said current detecting means comprises a timing signal generating circuit for generating a predetermined timing signal a first switch circuit including $(n+1)$ numbers of first terminals composed of n numbers of terminals connected to said n numbers of current sources and a terminal connected to said additional output of said digital-to-analog converting means and two second terminals,

and first and second resistance circuits connected to said two second terminals, respectively, said timing signal being supplied to said first switch circuit to sequentially select one of said n number of terminals every predetermined time period within a cycle time determined by said timing signal and to alternately connect the selected one of said n numbers of terminals and said terminal connected to said digital-to-analog converting means with said two second terminals, respectively, in each time period, whereby said first switch circuit sets up the above connecting pattern between said (n+1) numbers of first terminals and said two second terminals, and

wherein said means for detecting said low frequency component comprises a capacitor connected to one of said second terminals, an amplifier circuit connected to said capacitor, a phase sensitive detector connected to said amplifier circuit, n numbers of low-pass filter circuits connected to said n numbers of current sources, respectively, and a second switch circuit for selectively connecting between said phase sensitive detector and said n numbers of low-pass filter circuits, said timing signal being supplied to said second switch circuit from said timing signal generating circuit to connect the low-pass filter circuit connected to the current source connected to said selected first terminal and said phase sensitive detector.

4,549,167

METHOD OF ENCODING AND DECODING BINARY DATA

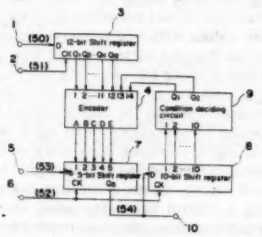
Misao Kato, Katano; Yasuharu Shimeki, Suita; Hiroshi Matsushima, and Kousou Takeuchi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 2, 1984, Ser. No. 585,589

Claims priority, application Japan, Mar. 3, 1983, 58-35412; Sep. 1, 1983, 58-161322

Int. Cl.[4] H03K *13/24*

U.S. Cl. 340—347 DD **24 Claims**



1. A method of encoding and decoding binary data, comprising encoding steps and decoding steps,

the encoding steps including:

dividing the binary data into 2-bit data groups each acting as an original datum;

converting each original datum into a 5-bit code acting as a conversion code; and

modulating the conversion codes such that a bit in a first state and a bit in a second state correspond to transition and non-transition, respectively;

the decoding steps including:

demodulating the modulated conversion codes into a conversion code sequence; and

converting reversely the conversion code sequence into a 2-bit original data sequence at intervals of 5 bits.

4,549,168

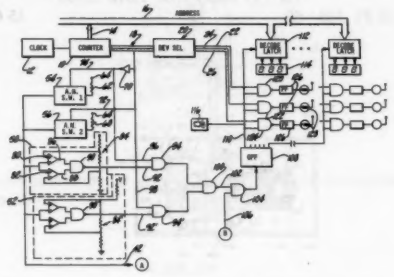
REMOTE STATION MONITORING SYSTEM

Ryszard Sieradzki, 142 Woodview Ct. #396, Rochester, Mich. 48063

Filed Oct. 6, 1983, Ser. No. 539,485

Int. Cl.[4] G08B *25/00, 29/00*

U.S. Cl. 340—525 **7 Claims**



1. A device for monitoring the condition of a plurality of remote stations comprising:

a plurality of remote sensors, each sensor comprising a resistor having one end connected to a preset voltage level, at least one sensor associated with each remote station,

means for sequentially measuring said electrical characteristic of each sensor comprising,

means for generating a waveform to each sensor resistor, said waveform comprising alternating first and second pulse trains, said first pulse train having a plurality of voltage pulses of a first predetermined amplitude and said second pulse train having a plurality of voltage pulses of a second predetermined amplitude, said first and second amplitudes being different from each other,

means for detecting a voltage differential across each sensor resistor,

means for comparing each measured voltage differential from said sensors with a predetermined value and for generating an output signal when said measured voltage differential from any one sensor differs from said predetermined value by a predetermined amount,

means responsive to said comparing means output signal for identifying said one sensor

wherein said comparing means comprises a first and second voltage comparator each having two inputs and an output,

means for electrically connecting said voltage differential to one input of each comparator, a predetermined voltage source electrically connected to the other input of said comparator, a further predetermined voltage source electrically connected to the other input of said second comparator, switch means for electrically connecting said first comparator output to said identifying means only when said voltage pulse in said waveform is of said first amplitude and for electrically connecting said second comparator output to said identifying means only when said voltage pulse on said waveform is of said second amplitude.

4,549,169

PERSONAL OCEAN SECURITY SYSTEM

Michael Moura, Fairhaven; Lenine Gonsalves, North Dartmouth, and Gilbert Fain, Seekonk, all of Mass., assignors to Kelmar Marine Inc., Fairhaven, Mass.

Filed Dec. 6, 1982, Ser. No. 447,302

Int. Cl.[4] G08B *1/08, 23/00*

U.S. Cl. 340—539 **21 Claims**

1. Apparatus for monitoring the security of one or more persons in a waterside environment comprising:

one or more means for transmitting an individualized signal

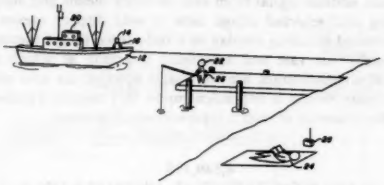
and adapted to be worn about the body of said one or more persons in a location insuring submergence of said transmitting means upon immersion of a person wearing it in the water;

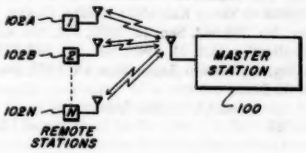
said transmitting means transmitting said individualized signal in an emission band which is suppressed upon submergence of the transmitting means in the water;

means for receiving and recognizing transmitted, individualized signals, the recognition being of the identity of the originating transmitting means further comprising:

means for generating a master time signal;

means for generating a code signal according to the master time signal;





means for correlating the received transmitted, individualized signal with said code signal providing a correlator output signal upon correlation thereof; and

code receiver means for determining the identity of the individualized signal from among all received transmitted, individualized signals;

means for generating an alarm condition in the absence of reception and recognition of an individualized signal corresponding to one of said one or more transmitting means; and

means for suppressing the alarm condition in the presence a received and recognized signal.

4,549,170

SYSTEM FOR MANAGING A PANEL OF OBJECTS SUCH AS KEYS

Bernard M. Serres, 7, rue des Pommaries, 74000 Annecy le Vieux, and Joël R. Doucet, 15, rue Roger Salengro, 92130 Issy-les-Moulineaux, both of France

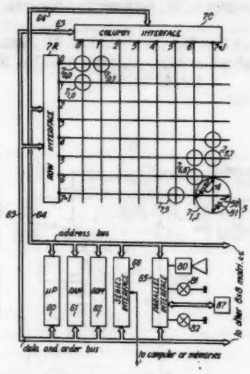
Filed May 10, 1983, Ser. No. 493,380

Claims priority, application France, May 17, 1982, 82 08569

Int. Cl.⁴ G08B *13/14*

U.S. Cl. 340—568 **28 Claims**

1. A system for managing an object panel on which an object has a respective location designated by an address and associated with a display means, said system comprising means for storing predetermined selectively changeable combinations of location addresses, means for successively reading said stored combinations, means for successively energizing said display means at locations designated by the read addresses of the same combination as one of the stored combinations to indicate that the objects are to be withdrawn or inserted at said locations, and means for detecting objects to check the withdrawal or insertion of said withdrawn or inserted objects in said panel, said display means at a location designated by a read address of a combination being energized and the display means at the location designated by the address previously read in said combination being deenergized in response to the detection of



the withdrawal or insertion of the object at said location designated by said previous address.

4,549,171

FLOATING OIL LEAK DETECTOR

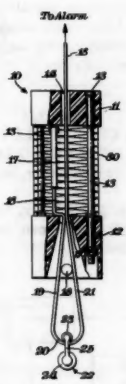
Juji Akiba; Satoru Kobayashi, both of Hitaka, and Hiroyuki Sugibuchi, Hoya, all of Japan, assignors to Junkosha Company Ltd., Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 568,058

Claims priority, application Japan, Jan. 28, 1983, 58-11840[U]

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—605 **5 Claims**



1. A floating leak detecting apparatus comprising:

a float assembly provided with an opening extending vertically therethrough,

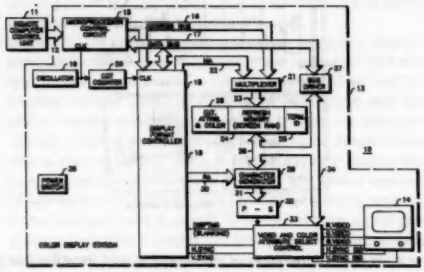
a sensor anchored to said float,

a lead wire electrically connected to said sensor and guided in such a way that it extends downwardly from said float, makes a U-turn, returns upwardly and extends out through the opening in said float upwardly and thence to alarm means, said wire having a moveable weight disposed at the U-turn for weighting down said lead wire.

4,549,172
MULTICOLOR DISPLAY FROM MONOCHROME OR MULTICOLOR CONTROL UNIT

John R. Welk, Addison, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 390,581, Jun. 21, 1982, abandoned.
This application Mar. 13, 1984, Ser. No. 587,869
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 6 Claims



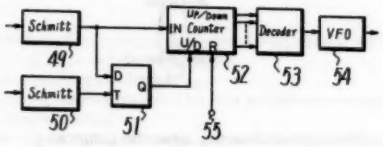
1. In a multicolor CRT visual display system comprising a color CRT display station connected to and controlled by a display control unit which may be a color control unit providing convergence control signals or a display control unit which does not provide convergence control signals, with said CRT display station being able to effectively receive, store and read back stored convergence control signals sent to said display station by said control unit if any such signals are sent, said display station having a preconverged CRT on which video characters are to be displayed, the convergence of the CRT being independent of said convergence control signals, the improvement comprising:

means for selectively implementing on said CRT in said display station a visual multicolor CRT display comprising any of at least three different colors in accordance with character attribute signals received by said color display station from said control unit regardless of whether convergence control signals are provided to said display station by said control unit.

4,549,173
APPARATUS FOR CONTROLLING THE SCROLLING RATE OF A VIDEO DISPLAY

Toshiteru Nakamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,517
Claims priority, application Japan, Sep. 8, 1981, 56-141232
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—726 8 Claims



1. Apparatus for controlling the vertical scrolling rate and direction of full-screen images of video image data comprising:

video display means for displaying a full-screen video image;

memory means for storing said video image data to be displayed on said display means at a plurality of addresses therein;

address signal generation means for generating an address signal supplied to said memory means for designating a succession of addresses within said memory means at which selected video image data is stored for vertical scrolling display of a full-screen image on said video display means, said succession of addresses being generated at a variable rate and sequential direction in response to an address renewal rate signal;

a rotatable control element for producing an angular rotational displacement signal representing vertical scrolling rate and sequential direction;

control means receiving said signal from said rotatable control element for producing said address renewal rate and direction signal therefrom; and

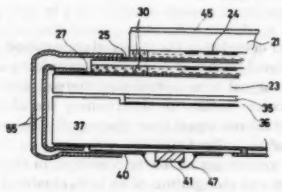
means for reading said selected image data designated by said address signal from said memory means and supplying said selected image data to said display means for vertical scrolling display of a full-screen image thereon;

whereby the rate and sequential direction at which said full-screen images are vertically scrolled on said video display means is dependent upon said angular rotational displacement of said rotatable control element.

4,549,174
ELECTRODE TERMINAL ASSEMBLY ON A MULTI-LAYER TYPE LIQUID CRYSTAL PANEL

Fumiaki Funada, Yamatokoriyama; Toshiaki Takamatsu; Shuhei Yasuda, and Masataka Matsuura, all of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 188,562, Sep. 18, 1980, Pat. No. 4,431,270.
This application Oct. 31, 1983, Ser. No. 547,373
Claims priority, application Japan, Sep. 19, 1979, 54-121276; Feb. 28, 1980, 55-24931
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 3 Claims



1. A display device comprising:

a predetermined number of supports stacked sequentially on top of each other;

liquid crystal material between said supports defining a liquid crystal cell between each two adjacent supports;

said supports having a first dimension which is progressively larger in said sequentially stacked supports and a second dimension, in a direction perpendicular to said first dimension, which is progressively smaller in said sequentially stacked supports, whereby said supports define oppositely facing upper and lower surfaces extending outwardly from said liquid crystal cells defining stepped configurations facing in opposite directions about the perimeter of said display device;

a matrix electrode pattern in each of said cells comprising electrodes having terminal portions extending outwardly from said cells onto said oppositely facing upper and lower surfaces of said oppositely facing stepped configurations;

a circuit board means positioned beneath said stack of supports and having terminals thereon which face away from said display device and away from both said upper and lower surfaces;

first flexible elastomeric members for electrically connecting said terminal portions on said outwardly extending upper surfaces to said terminals on said circuit board; and

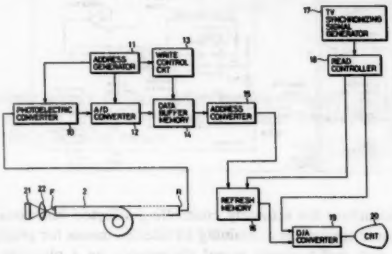
second elastomeric members for electrically connecting said

terminal portions on said outwardly extending lower surfaces to said terminals on said circuit board.

4,549,175
IMAGE TRANSMISSION APPARATUS USING A RANDOM ARRANGEMENT OF OPTICAL FIBERS

Mitsuru Rokunohe; Toshiyuki Nakajima, both of Amagasaki; Kansei Iwata, Tama, and Hiroyuki Tajima, Fuchu, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo and Graphica Computer Corporation, Tokyo, both of, Japan

Filed Oct. 6, 1982, Ser. No. 433,193
Int. Cl.⁴ G09G *1/00*
U.S. Cl. 340—794 **7 Claims**



1. An image transmission apparatus, comprising an optical fiber bundle consisting of a number of randomly arranged optical fibers for transmitting an optical image formed on the front end face thereof to the rear end face thereof, photoelectric conversion means for dividing the optical image formed on said rear end face of said bundle into elements of light information assigned to the addresses of the geometric positions of individual optical fibers of said optical fiber bundle in said rear end face and converting said elements of light information into electric signals, first memory means for storing the relationship between the addresses of the geometric positions of said individual optical fibers in the front end face of said optical fiber bundle and the addresses of geometric positions of said individual optical fibers in the rear end face of said bundle, means for rearranging the electric signals supplied from said photoelectric conversion means in correspondence with said addresses of positions of said individual optical fibers in the rear end face of said optical fiber bundle, said rearranging means including second memory means for storing said electric signals at addresses read out of said first memory means corresponding to the addresses of the geometric positions of the individual optical fibers in said rear end face of said optical fiber bundle, and a display device for displaying two-dimensionally the rearranged electric signals read out of said second memory means thereby to reproduce the optical image formed in said front end face of said optical fiber bundle.

4,549,176
DEVICE FOR IDENTIFYING AN INFORMATION PARTICULARLY AN ELECTRONIC LOCK/KEY COMBINATION

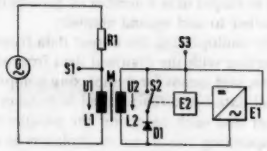
Hans-Dietrich Kreft, Reinbek, Fed. Rep. of Germany, assignor to Angewandte Digital Elektronik GmbH, Fed. Rep. of Germany

Filed Apr. 1, 1983, Ser. No. 481,385
Int. Cl.⁴ H04Q *9/00*; E05B *49/00*
U.S. Cl. 340—825.31 **9 Claims**

1. A device for identifying information for access control comprising:

a lock portion having a signal generator for generating a first signal, a first inductance coil connected to receive said first signal from said signal generator, an evaluation circuit connected to receive a second signal from said first inductance coil for comparing said second signal to a reference signal and producing an output when said second signal and said reference signal have a desired relationship therebetween;

a key portion having a second inductance coil capable of being inductively coupled to said first inductance coil, a rectifier element, a switch in series with said rectifier element, said switch and said rectifier element connected



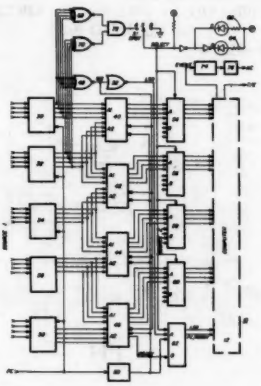
across said second inductance coil, means connected to said switch for controlling the operation thereof, said switch control means including counting means for counting signal events across said rectifier;

whereby operation of said switch in said key portion impresses said second signal on said first signal for comparison to said reference signal by said evaluation circuit in said lock portion.

4,549,177
PRECISION FATHOMETER INTERFACE ADAPTOR

Alan W. Warburton, Long Beach, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 6, 1983, Ser. No. 482,692
Int. Cl.⁴ H04Q *1/39*
U.S. Cl. 340—825.57 **2 Claims**



1. A precision fathometer interface adaptor for automatically logging digitized data from two separate sources for input to a computer, the data from one source being characterized by a first number of digits represented by a first plurality of parallel bit inputs and the data from the other source being characterized by a second number of digits that is one less than the first number and is represented by a second plurality of parallel bit inputs, said interface adaptor comprising:

an input buffer into which the digitized data from said one of said sources is input, said input buffer comprising a plurality of parallel bit flip-flops equal in number to said first number and each operable to provide corresponding first parallel bit outputs as output data;

means for converting the output data from said input buffer into a form compatible with said computer, said means for converting comprising a plurality of multiplexers equal in number to said second number, each connected to receive as a pair of inputs the parallel bit outputs of a different pair of said plurality of flip-flops and to provide a second parallel bit output corresponding to a selected one of the pair of inputs, whereby said means for converting provides as output data a number of parallel bit outputs equal in number to said second number;

means for multiplexing the output data from said means for converting with the digitized data from the other of said sources, said means for muliplexing comprising a plurality of dual data bus circuits equal in number to said second number and each receiving the parallel bit output of a corresponding one of said multiplexers as a first input and also receiving one of said second plurality of parrallel bit inputs as a second input, said dual data bus circuits being responsive to alternative conditions of a select signal to provide one or the other of said first and second inputs as a selected output to said computer; and

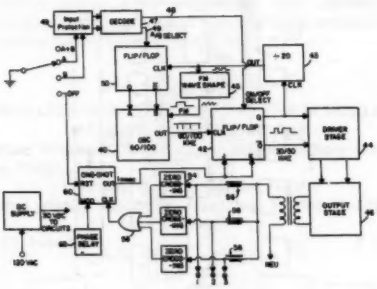
means for generating said alternative conditions of said select signal for selecting the output from said multiplexing means for input to said computer.

4,549,178

ENERGY CONTROL SYSTEM WITH TRANSMITTER HAVING CHANNEL MULTIPLEXING AND FREQUENCY MODULATION

James N. Lester, Rockport, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 11, 1983, Ser. No. 540,723
Int. Cl.⁴ H04Q *9/00*
U.S. Cl. 340—825.58 **19 Claims**



1. A transmitter system for generating control signals for controlling at least one load, said system comprising:

a frequency controllable oscillator;

means coupled from said oscillator for providing alternating cycle control signals to control drive of said load;

means responsive to the oscillator frequency for providing a divided frequency signal of lower frequency than that of the oscillator; and

feedback means including biphase means responsive to said divided frequency signal coupled to and for controlling said oscillator;

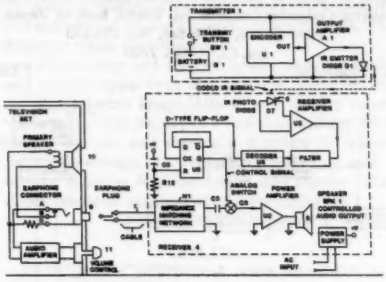
whereby the oscillator output frequency is switchable at the divided frequency signal rate from a first frequency to a second frequency.

4,549,179

APPARATUS FOR REMOTE CONTROL OF VOLUME AND POWER ON ELECTRONIC EQUIPMENT POSSESSING AN AUDIO OUTPUT

William J. Stendardo, 664 Youngs Ct., San Jose, Calif. 95127

Filed Mar. 4, 1983, Ser. No. 472,389
Int. Cl.⁴ H04Q *9/00*; H04B *1/40*
U.S. Cl. 340—825.69 **10 Claims**



1. Structure for remotely controlling selected functions of electronic equipment containing an internal means for producing a first audio output signal discernable by a plurality of listeners and a connector for earphones such that when earphones are connected to said connector for earphones said internal means for producing a first audio output signal is disabled and an electrical signal containing audio information is transmitted to said earphones, which comprises

second means, external to said electronic equipment, for producing a second audio output signal,

connector means for connecting said second means for producing a second audio output signal to the connector for earphones on said electronic equipment, thereby to disable said internal means for producing a first audio output signal on said electronic equipment and to transmit said electrical signal containing audio information produced by said electronic equipment to said second means for producing a second audio output signal,

means for turning on and off said second means for producing a second audio output signal thereby to turn on and off said second audio output signal, and

means, to be operated by a user, for transmitting signals to said means for turning on and off said second means for producing, thereby to allow a user to remotely control the presence or absence of said second audio output signal.

4,549,180

PROCESS VARIABLE TRANSMITTER

Hisaki Masuda, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 13, 1982, Ser. No. 408,047
Claims priority, application Japan, Aug. 13, 1981, 56-127158
Int. Cl.⁴ H04Q *9/00*
U.S. Cl. 340—870.04 **7 Claims**

1. A process variable transmitter for transmitting a process variable to a receiving instrument at a location remote from said transmitter, comprising:

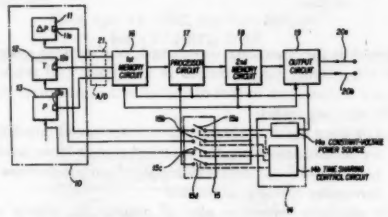
a plurality of process variable detector units for detecting a primary process variable to be measured and for detecting secondary process variables which affect the primary process variable;

a memory circuit for storing detected outputs supplied from the process variable detector units;

processing means for reading the detected outputs of the memory circuit and then correcting the detected output indicative of the primary process variable based on the

detected outputs indicative of the secondary process variables;

means for converting the corrected detected output to an output current signal and for transmitting said current signal to said remote receiving instrument; and



power supply control means for intermittently supplying electric power to the process variable detector units and the processing means.

4,549,181

MOVING OBSTACLE DETECTION SYSTEM FOR A VEHICLE

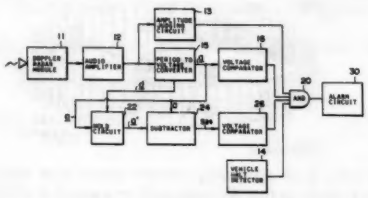
Akira Tachibana, and Masami Kiyoto, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 428,225

Claims priority, application Japan, Oct. 31, 1981, 56-161891[U]

Int. Cl.⁴ G08G *1/00*; G01S *15/93, 13/00*

U.S. Cl. 340—904 **15 Claims**



1. A moving obstacle detection system for a vehicle, comprising:

(a) a Doppler radar transceiver for transmitting an electromagnetic radiation signal of known frequency, receiving the reflected radiation from moving objects within a specified detection area exposed to the transmitted radiation, and outputting a Doppler beat signal comprising a linear function of the transmitted and received radiation signals;

(b) means responsive to said Doppler signal for indicating that an obstacle is moving towards or away from the vehicle when the rate of change of frequency of said Doppler signal exceeds a first predetermined value; and

(c) inhibiting means responsive to said Doppler signal for preventing operation of said indicating means when the rate of change of frequency of said Doppler signal exceeds a second predetermined value exceeding the first predetermined value.

4,549,182

SYSTEM FOR ENCOURAGING THE RETURN OF VEHICLES SUCH AS TROLLEYS

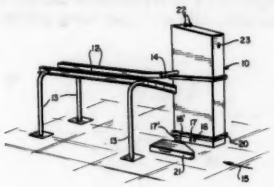
Guy Gillet, Deols, France, assignor to Supermarket Systems, Paris, France

Filed Sep. 27, 1982, Ser. No. 424,781

Claims priority, application France, Jun. 21, 1982, 82 10826

Int. Cl.⁴ G08G *1/00*

U.S. Cl. 340—942 **10 Claims**



1. A system for encouraging users to return vehicles such as trolleys to a vehicle storage area having an entrance fitted with said system by dispensing a reward if a vehicle is effectively returned, while preventing said reward from being dispensed in the event of an attempted fraud or removal of a vehicle from said storage area via said entrance thereto, said system comprising first and second detectors disposed along a vehicle return path at said entrance, said detectors being spaced relative to each other so as to be capable of responding to two members of a vehicle as said vehicle is moved along said path past said detectors, said two members comprising a front member and a rear member which are spaced along said vehicle in the direction of vehicle movement by a distance which is greater than the distance separating the detectors, said movement of said vehicle past said detectors being made in the following sequence:

(a) said first detector only;

(b) said first detector and said second detector simultaneously; and,

(c) said second detector only and

means to apply vehicle-detection signals from said detectors to a processor circuit connected to control the dispensing of said rewards.

4,549,183

INTERFERENCE SUPPRESSOR FOR AN ELECTRONICALLY OR MECHANICALLY SCANNING MONOPULSE RADAR GENERATING SUM AND DIFFERENCE SIGNALS FROM RECEIVED MICROWAVE ENERGY

Alfonso Farina, Rome, Italy, assignor to Selenia SpA, Rome, Italy

Filed Aug. 2, 1982, Ser. No. 404,236

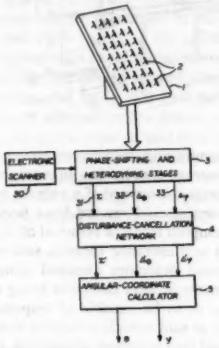
Int. Cl.⁴ G01S *13/44, 7/28*

U.S. Cl. 343—7 A **3 Claims**

1. In a monopulse radar wherein an antenna with a radiation pattern subjected to a scanning displacement feeds incident microwave energy contaminated by interfering radiation to a receiving section of a processor having a sum channel and at least one difference channel emitting respective raw output signals Σ and Δ,

the combination therewith of cancellation means comprising a respective disturbance estimator associated with each of said channels and a subtractor in an output lead of each channel receiving a contamination signal from the associated disturbance estimator for converting the raw output signals Σ and Δ into respective purged output signals Σ' and Δ' of said sum and difference channels each disturbance estimator including an adaptive loop connected to the output lead of the associated channel at a point downstream of the subtractor thereof for receiving the purged output signal of said associated channel and further con-

nected to the output lead of the respective other channel at a point upstream of the subtractor of the latter for receiving the raw output signal of said other channel, said adaptive loop of each disturbance estimator comprising a first and a second mixer with inputs connected in parallel to the respective other channel, said first mixer further receiving the purged output signal from the associated channel for generating a corrective signal fed via an integrator to said second mixer for modulating said contamination signal prior to transmission thereof to the associated subtractor, said processor being provided with two



difference channels emitting raw signals Δ_θ and Δ_ϕ and respectively representing the azimuthal and elevational monopulse beams of incident radiation, the disturbance estimator of said sum channel further including an adder supplying the subtractor thereof with the sum of said raw signals Δ_θ and Δ_ϕ from said difference channel, each of said difference channels further including an adder supplying the subtractor thereof with the sum of said raw signal Σ and the raw signal Δ_ϕ, Δ_θ from the respective other difference channel for converting the raw signals Δ_θ and Δ_ϕ into respective purged signals Δ'_θ and Δ'_ϕ.

4,549,184

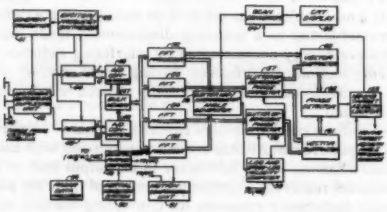
MOVING TARGET ORDNANCE CONTROL

Sol Boles, Syosset, and Walter J. Smrek, Lake Ronkonkoma, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 272,048, Jun. 9, 1981, which is a continuation of Ser. No. 10,003, Feb. 7, 1979, abandoned. This application Apr. 30, 1982, Ser. No. 373,806

Int. Cl.⁴ G01S *13/90, 13/52*

U.S. Cl. 343—11 R **17 Claims**



1. In conjunction with an AMTI synthetic aperture radar system having an interferometer antenna and a range versus azimuth angle display, a method for determining with improved accuracy the azimuth angle of a moving target having a radial component of velocity relative to the electrical boresight of the interferometer antenna comprising the steps of:

(a) calculating the radial component of velocity Vm of the moving target;

(b) shifting the observed net doppler frequency of the moving target by the quantity

$$-\frac{2\,Vm}{\lambda}$$

where λ is the operating wavelength of the radar system, so that the moving target resides in a doppler cell whose frequency corresponds to that of clutter in the immediate vicinity of the moving target;

(c) plotting the data obtained from interleaved interferometric measurements on the received signals from stationary clutter and fixed targets as doppler frequency versus interferometer azimuth angle; and

(d) obtaining from the plot of doppler frequency versus interferometer azimuth angle for the stationary clutter and fixed targets the azimuth angle relative to the electrical boresight of the antenna of clutter in the immediate vicinity of the moving target.

4,549,185

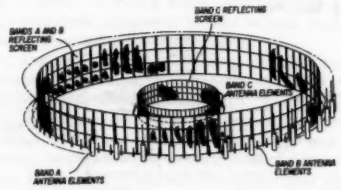
SIGNAL DISTRIBUTION SYSTEM

Thomas O. Dixon, Seabrook, Md., assignor to Amstar Technical Products Co., Inc., New York, N.Y.

Filed Nov. 3, 1981, Ser. No. 317,606

Int. Cl.⁴ H01Q *3/22, 3/24*

U.S. Cl. 343—368 **3 Claims**


BAND C REFLECTING SCREEN
BANDS A AND B REFLECTING SCREEN
BAND C ANTENNA ELEMENTS
BAND A ANTENNA ELEMENTS
BAND B ANTENNA ELEMENTS

1. A method of combining antenna beams from different frequency bands so that the same port on a signal distribution system can be used for a plurality of beams, comprising the steps of:

receiving radio signals in a circularly disposed antennae array and forming a plurality of bands of beams each band covering a frequency interval adjacent to at least one of the other of said plurality of bands of beams and wherein each band has a plurality of beams with each beam oriented in order to provide a corresponding directionally symmetrically area coverage of an area encompassing a 360° circle about said array;

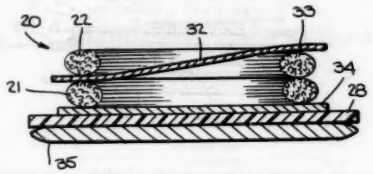
combining a plurality of groups of beams each said group comprising a selected one of said plurality of beams from each said band selected in such a manner that each one of said selected one of said plurality of beams from each band is oriented so as to be in a substantially different direction from the orientation of any of the other of said selected beams which are from a band whose frequency interval is adjacent the band of said selected one of said plurality of beams.

4,549,186

COIL ASSEMBLY FOR SUBSTANTIALLY ISOTROPIC FLUX LINKAGE IN A GIVEN PLANE

Thomas A. O. Gross, Lincoln, Mass.; Raymond L. Barrett, Jr., Oakland Park, and Henry F. Pfister, Wilton Manors, both of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Apr. 14, 1982, Ser. No. 368,370
Int. Cl.[4] H01Q *7/00*
U.S. Cl. 343—748 20 Claims



1. A coil assembly for use in a communication system in which coupling between said assembly and another communication component is to be established by linking said assembly and said component with an alternating magnetic field, said assembly comprising a coil having electrically conductive turns assembled in the form of a flat pancake shape loop encircling a central axis and having a thickness dimension parallel to said axis substantially less than its dimension normal to said axis, and means including magnetically permeable material cooperatively disposed adjacent said conductive turns and interrelated therewith for providing substantially isotropic flux linkage between said coil assembly and said magnetic field in a plane that contains said central axis, wherein said means comprises a second coil of pancake configuration disposed alongside, generally parallel, and magnetically coupled to said first mentioned coil.

4,549,187

METALLIC COATED AND LUBRICATED AMORPHOUS SILICA YARN USED AS A MESH ANTENNA REFLECTOR

Donald J. Levy, Mt. View, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Apr. 5, 1982, Ser. No. 365,192
Int. Cl.[4] H01Q *1/36;* B01D *39/08*
U.S. Cl. 343—897 10 Claims

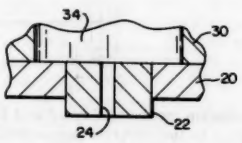
1. An antenna material comprising a plurality of amorphous silica yarns in a mesh configuration, each of said yarns consisting of a multiplicity of silica fibers, an electrtically conductive metal coating on at least the outer surfaces of said yarns and a surfactant-containing lubricant covering and adhering to at least the non-metallized surfaces of said silica fibers in said yarns.

4,549,188

ORIFICE PLATE FOR INK JET PRINTER

Craig Shackleton, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 9, 1984, Ser. No. 569,354
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 4 Claims



1. A method for preparing an ink jet printing plate from a blank which includes:

(i) a plurality of cylindrical glass elements, each having a centrally positioned core of an acid etchable glass, said core having a diameter of about 0.0005–0.0015 inch, each having an outer diameter from about three to six times its inner diameter;

(ii) said cylindrical glass elements being bonded vertically in a ceramic sheet in equidistant linear alignment with each face of said cylindrical glass elements being flush with one face of said ceramic sheet; and

(iii) the bottom surface of said ceramic sheet being bonded to a rigid support sheet having openings therein which communicate with said cylindrical glass elements; and

(iv) the ceramic in said ceramic sheet being more rapidly etched by hydrofluoric acid than the glass in the annuli of said cylindrical glass elements;

said method comprising:

(a) forming a hydrofluoric acid resistant coating on the top surfaces of each of the cylindrical glass elements of said blank and attaching a liquid-tight cover to the bottom surface of said blank;

(b) contacting the article of step (a) with a hydrofluoric acid solution for a period of time sufficient to dissolve a portion of the top surface of the ceramic sheet so that the cylindrical glass elements project from the top surface of said ceramic sheet;

(c) removing the hydrofluoric acid resistant coating from the top surfaces of said cylindrical glass elements; and

(d) treating the cores of said cylindrical glass elements with an acid to dissolve said cores and provide orifices in said cylindrical glass elements.

4,549,189

THERMAL PRINTING HEAD

Yoshiyuki Shiratsuki, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,291
Claims priority, application Japan, Jun. 4, 1982, 57-95703
Int. Cl.[4] H05B *1/00*
U.S. Cl. 346—76 PH 16 Claims

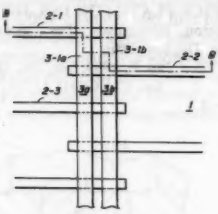
1. A thermal printing head comprising:

an electrode pattern formed on an insulating substrate, each electrode of said electrode pattern being arranged in a direction perpendicular to the scanning direction;

a plurality of heating resistors extending in the scanning direction but spaced apart in said perpendicular direction by a predetermined width between adjacent ones of said resistors and connected to each electrode of said electrode pattern;

a protecting layer for covering heating portions of said

plurality of heating resistors, said portions extending between said adjacent electrodes of said electrode pattern and between said adjacent resistors, whereby the temperature distribution on the surface of said heating portions with respect to the direction perpendicular to the scanning direction is substantially flat.

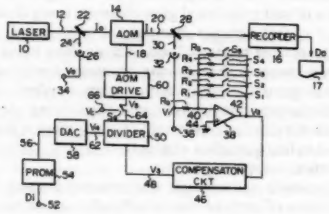


4,549,190

LIGHT QUANTITY COMPENSATION APPARATUS

Yuji Ohara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1983, Ser. No. 550,425
Claims priority, application Japan, Nov. 10, 1982, 57-196122
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—108 **6 Claims**



1. Apparatus for compensating for a quantity of light, comprising:

acoustooptic modulator means for modulating light incident thereon in response to a first signal to produce output light;

photoelectric converter means for detecting a level of said output light to produce a second signal which is associated with said detected level; and

compensation circuitry for compensating for the first signal in response to the second signal;

said compensation circuitry having input-to-output characteristics corresponding to a linear function which is defined by approximating a characteristic of the acoustooptic modulator means on the output light relative to the first signal, thereby compensating for the first signal in accordance with said input-to-output characteristics.

4,549,191

MULTI-NOZZLE INK-JET PRINT HEAD OF DROP-ON-DEMAND TYPE

Hiromichi Fukuchi, and Toyoji Ushioda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,806
Claims priority, application Japan, Jul. 4, 1983, 58-121301
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **14 Claims**

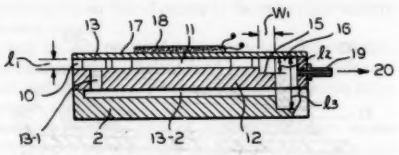
1. An on-demand type ink-jet print head for ejecting ink droplets, said print head comprising:

a plurality of nozzles for ejecting said ink droplets;

a common ink reservoir filled with ink;

a plurality of pressure chambers located between said nozzles and said ink reservoir to receive and hold ink supplied from said reservoir, means individually associated with each of said chambers for individually exerting pressure on the ink in each of said chambers for ejecting said ink droplets from selected ones of said nozzles;

a first ink supply portion located between said pressure chambers and said ink reservoir for supplying said ink from said ink reservoir to said pressure chambers, said first ink supply portion having a depth which is small enough to provide a capillary attraction of said ink from said ink reservoir;



capacity areas located between said nozzles and said pressure chambers, said capacity areas having dimensions which are smaller that the dimensions of said pressure chambers; and

ink supply paths located between said capacity areas and said ink reservoir, the ink being supplied from said ink reservoir through said ink supply paths to said capacity areas.

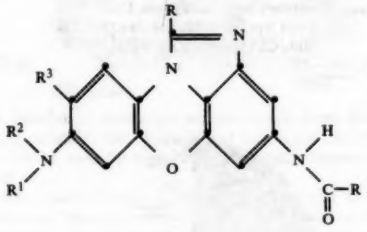
4,549,192

ELECTROCHROMIC MARKING SYSTEMS

William M. Hung, Cincinnati, Ohio, assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Jul. 31, 1984, Ser. No. 636,471
Int. Cl.[4] B41M *5/20*
U.S. Cl. 346—218 **6 Claims**

1. A substrate for use in electrochromic recording comprising a support sheet containing as a color-forming substance a 1-R—4—(N—R—CO)amino-8-[N-(R^1)(R^2)amino]-9-R^3-imidoxophenoxazine having the formula



wherein:

R represents non-tertiary C_1 to C_4 alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_4 alkyl substituted with halogen, non-tertiary C_1 to C_4 alkoxy or non-tertiary C_1 to C_4 alkoxycarbonyl, phenyl or phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl, cyano, or trihalomethyl;

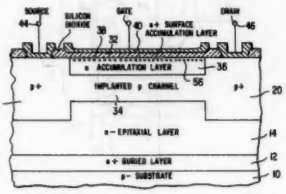
R^1 and R^2 independently represent C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy; and

R^3 and represents hydrogen or non-tertiary C_1 to C_4 alkyl.

4,549,193
FIELD EFFECT TRANSISTOR DEVICE UTILIZING CRITICAL BURIED CHANNEL CONNECTING SOURCE AND DRAIN

Satwinder D. Malhi, and Clement A. Salama, both of Toronto, Canada, assignors to University of Toronto Innovations Foundation, Toronto, Canada

Filed Sep. 23, 1981, Ser. No. 304,998
Claims priority, application Canada, Sep. 26, 1980, 362480
Int. Cl.⁴ H01L *29/80*
U.S. Cl. 357—22 **3 Claims**



1. A subsurface junction effect transistor device having a gate, a p-type source and a p-type drain, said device comprising:

a layer of n-type epitaxial silicon material having a surface;

a p-type channel implanted in the said layer of n-type epitaxial silicon material below the surface thereof to provide an electron accummulating n-type layer between said p-type channel and an adjacent portion of said surface of the n-type epitaxial silicon material said electron accummulating n-type layer having a layer thickness corresponding to its local extrinsic Debye length, and said p-type channel having a channel thicknes more than an order of magnitude greater than the extrinsic Debye length of said electron accumulating layer;

said p-type channel directly merging into said p-type source and said p-type drain;

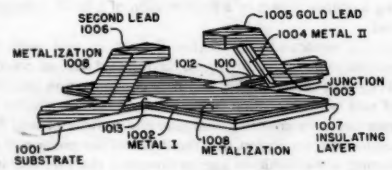
a silicon dioxide passivating layer overlying at least the electron-accumulating n-type layer; and

a conductive metal layer electrically connected to the gate said conductive metal layer overlying the silicon dioxide passivating layer and said conductive metal layer constituting means for providing an electron-accumulating n-type zone in the electron-accumulating n-type layer at said adjacent protion of said surface interfacing with said silicon dioxide passivating layer, said electron accumulating n-type zone providing an electric field for raising the surface potential in the electron accumulating n-type zone above the potential of the gate for buffering said p-type channel from said silicon dioxide passivating layer.

4,549,194
LIGHT SENSITIVE DETECTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 29, 1982, Ser. No. 365,352
Int. Cl.⁴ H01L *31/00*
U.S. Cl. 357—30 **5 Claims**



1. A light sensitive detector comprising:

(a) a planar substrate selected from a group consisting of semiconductors and dielectrics, having one planar surface considered as its upper surface,

(b) a layer of electrically insulating material, referred to as an insulating layer on said upper surface of said substrate, said insulating layer ranging in thickness from 1000 to 4000 Å.

(c) a first metal layer on the upper surface of said insulating layer, said first metal layer ranging in thickness from 100 to 500 Å.

(d) a first peninsula-like projection of said first metal layer, referred to as a first projection, having a tip at the end of said first projection which is located on said insulating layer in an area in which there is no first metal layer on any side of said first projection, said first projection tip being generally orthogonal to said upper surface of said substrate and ranging in length from 0.1 to 1.0 microns,

(e) a first metal oxide layer on said first projection tip,

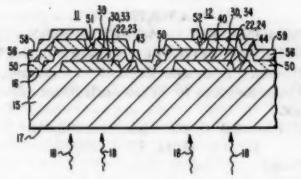
(f) a first lead extending along a portion of said upper surface of said substrate not covered by said metal layer, but which is covered by said insulating layer, a portion of said first lead extending above said upper surface of said substrate in a semi-arch configuration,

(g) a second metal layer located between said first lead and said upper surface of said insulating layer, said second metal layer and said first lead being positioned to contact said first metal oxide layer on said first projection tip, the point of this contact determining the point at which said first lead extends upward and over the surface of said first projection as well as over said first metal layer in said semi-arch configuration, said second metal layer beneath said first lead being undercut on both sides of said first lead to be substantially the length of said first projection tip in the area of contact.

4,549,195
HETEROJUNCTION SEMICONDUCTOR DEVICE

Nathan Bluzer, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1983, Ser. No. 485,091
Int. Cl.⁴ H01L *27/14, 29/161*
U.S. Cl. 357—30 **35 Claims**



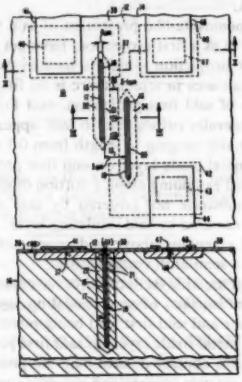
1. A semiconductor device comprising a semiconductor substrate having an upper surface, a first layer of n-type semiconductor material having a first composition and a first energy band gap, said first layer supported by said substrate and terminating interior of the edge of said upper surface of said substrate, a second layer of p-type semiconductor material having a second composition and a second energy band gap, said second layer covering said first layer and extending beyond the perimeter of said first layer and onto said substrate, a layer of passivation over said second layer, first means for making electrical contact to said first layer and second means for making electrical contact to said second layer.

4,549,196

LATERAL BIPOLAR TRANSISTOR

Francis J. Kub, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 4, 1982, Ser. No. 405,000
Int. Cl.[4] H01L *29/72, 29/06*
U.S. Cl. 357—35 **10 Claims**



1. A bipolar transistor comprising:
a substrate of semiconductor material having an upper surface and a predetermined crystalline orientation;
said substrate doped with impurities of a first type;
first and second regions spaced apart and doped with impurities of a second type;
a plurality of grooves numbered in sequence to form even numbered and odd numbered grooves formed in said substrate adjacent one another from said upper surface and having spaced apart side walls between adjacent grooves;
said side walls being doped with impurities of said second type;
said even numbered grooves intersecting said first region; and
said odd numbered grooves intersecting said second region.

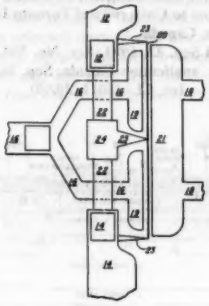
4,549,197

COMMON-GATE GAAS FET DESIGN FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Gailon E. Brehm, Plano, and Randall E. Lehmann, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,416
Int. Cl.[4] H01L *27/02, 29/80*
U.S. Cl. 357—41 **15 Claims**

1. A monolithic common-gate active device, comprising:
a gate, said gate comprising a stripe of metal having a lesser dimension of less than one and one half microns and a greater dimension which is more than 100 microns;
a plurality of source regions, said source regions being positioned parallel, adjacent to, and separated from said gate, all of said plurality of source regions being commonly fed;
a drain region, said drain region being parallel, adjacent to, and separated from said gate, said source and drain regions lying on opposite sides of said gate;
said plurality of source regions being fed by respective source feed, all of said source feeds being connected together in common;
a gate pad, said gate pad being connected to said gate and being positioned within the area defined by said plurality of source feeds;
a ground contact; and



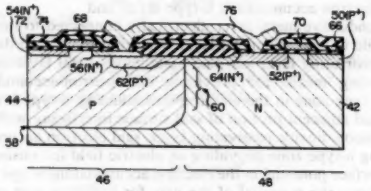
an air bridge connecting said gate pad over at least one of said source feeds to said ground contact.

4,549,198

SEMICONDUCTOR DEVICE

Takeo Kondo, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 324,631, Nov. 24, 1981. This application Aug. 29, 1984, Ser. No. 645,534
Claims priority, application Japan, Nov. 29, 1980, 55-168581
Int. Cl.[4] H01L *27/02, 29/78*
U.S. Cl. 357—42 **2 Claims**



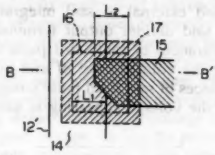
1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a semiconductor well of a second conductivity type formed in said semiconductor substrate, boundary formed between said well and substrate, the boundary having a bottom substantially parallel to a major surface of said substrate and a side substantially perpendicular to said major surface;
a first semiconductor region of said first conductivity type formed in said well, the first semiconductor region forming a source region or a drain region of a MOS transistor; and
a second semiconductor region formed in said well, the second semiconductor region having said second conductivity type with a higher impurity concentration than that of said well, a portion of said second semiconductor region partially covering said side and bottom of said first semiconductor region, and the depth of the portion of the second semiconductor region covering the side and bottom of said first semiconductor region being greater than the depth of the remainder of said second semiconductor region.

4,549,199

SEMICONDUCTOR DEVICE PROVIDING A CONTACT STRUCTURE WHICH CAN BE MINIATURIZED

Takahiko Yamauchi; Teruo Seki, both of Kawasaki, and Keizo Aoyama, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 14, 1983, Ser. No. 513,611
Claims priority, application Japan, Jul. 24, 1982, 57-129177
Int. Cl.[4] H01L *23/48, 29/04, 29/06*
U.S. Cl. 357—68 12 Claims



1. A semiconductor device having a semiconductor substrate, comprising:

a connection structure including:

a first conductive layer formed in or on the semiconductor substrate;

a second conductive layer arranged adjacent to said first conductive layer; and

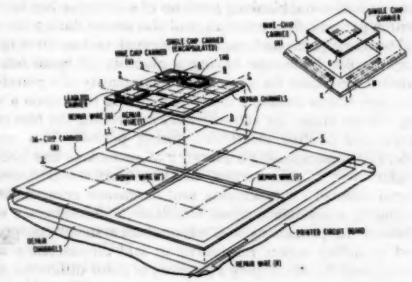
a third conductive layer connecting said first conductiver layer to said second conductive layer by being in contact with said first and second conductive layers in a quadrangular contact region which is formed where said first conductive layer is adjacent to said second conductive layer and is defined so as to extend over said first and second conductive layers, the portion of said second conductive layer located within said quadrangular contact region having a pattern such that the width of said second conductive layer in a direction along one side or said quadrangular contact region is narrower at a predetermined section of said second conductive layer than at a section thereof spaced from the predetermined section along the longitudinal direction of said second conductive layer from the end thereof.

4,549,200

REPAIRABLE MULTI-LEVEL OVERLAY SYSTEM FOR SEMICONDUCTOR DEVICE

Mario E. Ecker, Poughkeepsie, N.Y., and Leonard T. Olson, Poyntelle, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 8, 1982, Ser. No. 396,204
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—80 18 Claims



2. An improved multi-level integrated packaging structure for supporting and electrically interconnecting a plurality of integrated circuit chips comprising:

a tiered support structure having a primary support frame, a plurality of secondary planar support frames mounted on said primary support frame and a plurality of single chip carriers mounted on said secondary support planar frames;

said primary support frame and each of said secondary support frames having a wiring pattern providing connection contacts, engineering change wiring channels and contacts thereon;

integrated circuit chips mounted on said single chip carriers, said chip carriers having exposed contact means and, wiring for electrically interconnecting said integrated circuit chip to said contact means;

first connection means for connecting predetermined contacts of said single chip carriers to predetermined connection contacts on said secondary planar support frames, and;

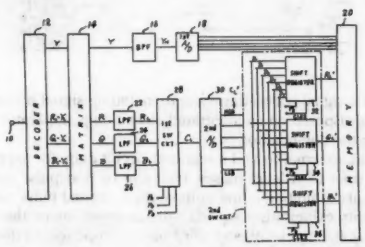
second connection means for connecting predetermined contacts of said secondary planar support frames to predetermined contacts of said primary planar support frame.

4,549,201

CIRCUIT ARRANGEMENT FOR DIGITIZING AND STORING COLOR VIDEO SIGNAL

Hideshi Tanaka; Hisanori Tsumiyama, both of Yokohama; Yoshio Mizuno, Kamakura; Terumi Ohara, Yokohama; Toshinori Takahashi, Kawasaki; Shigeru Kato, Tokyo, and Tsutomu Kiuchi, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Oct. 28, 1983, Ser. No. 546,538
Int. Cl.[4] H04N *9/32*
U.S. Cl. 358—13 6 Claims



1. A circuit arrangement for digitizing a color video signal and for storing digitized data, comprising:

(a) means responsive to said color video signal for producing a frequency-limited luminance signal whose frequency is higher than a first cut-off frequency and lower than a second cut-off frequency which is higher than said first cut-off frequency, and three frequency-limited chrominance signals whose frequency is lower than said first cut-off frequency;

(b) a first analog-to-digital converter responsive to said frequency-limited luminance signal for producing luminance digital data by using a first sampling signal having a first sampling frequency;

(c) a first switching circuit for passing said three frequency-limited chrominance signals one after another at a switching frequency which is substantially three or more times said first cut-off frequency, so as to produce a single time-sharing signal;

(d) a second analog-to-digital converter responsive to said time-sharing signal for producing chrominace digital data by using a second sampling signal having a frequency which is three times said switching frequency;

(e) a second switching circuit responsive to said chrominance digital data for separating the same into a plurality of color data and for outputting said color data by sending

out data bits one after another for each of said color data in response to a clock pulse having the same frequency as that of said first sampling signal;

(f) means for producing said first and second sampling signals, a signal for determining said switching frequency, and said clock pulse; and

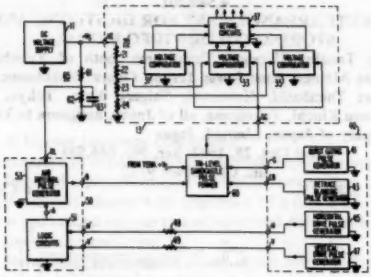
(g) a memory for storing said luminance digital data of a plurality of bits from said first analog-to-digital converter, and said chrominance digital data from said second switching circuit, each bit of said luminance digital data and said chrominance digital data being simultaneously written into said memory in response to said clock pulse.

4,549,202

TRILEVEL SANDCASTLE PULSE ENCODING/DECODING SYSTEM

James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,330
Int. Cl.[4] H04N 9/535
U.S. Cl. 358—17 **7 Claims**



1. In a signal translating system, including signal processing circuits disposed on an integrated circuit chip, apparatus comprising the combination of:

means, external to said integrated circuit chip, for supplying a train of trilevel pulses, inclusive of first pulse components exhibiting a first voltage level, second pulse components exhibiting a second voltage level lower than said first voltage level, and third pulse components exhibiting a third voltage level intermediate said first and second voltage levels, to a terminal of said integrated circuit chip;

a source of DC potential;

a first voltage divider, disposed on said integrated circuit chip and connected across said DC potential source;

a first voltage comparator, disposed on said integrated circuit chip, for comparing the voltage level of said pulse train with the level of a first reference voltage; said first voltage comparator having a reference input connected to a first intermediate point on said first voltage divider, at which said first reference voltage appears, and a signal input coupled to said chip terminal;

a second voltage comparator, disposed on said integrated circuit chip, for comparing the voltage level of said pulse train with the level of a second reference voltage, less than said first reference voltage; said second voltage comparator having a reference input connected to a second intermediate point on said first voltage divider, at which said second reference voltage appears, and a signal input coupled to said chip terminal;

a third voltage comparator, disposed on said integrated circuit chip, for comparing the voltage level of said pulse train with the level of a third reference voltage, intermediate said first and second reference voltages; said third voltage comparator having a reference input connected to a third intermediate point on said first voltage divider, at which said third reference voltage appears, and a signal input coupled to said chip terminal; and

means, disposed on said integrated circuit chip and responsive to outputs of said voltage comparators, for controlling the operation of said signal processing circuits;

wherein said trilevel pulse train supplying means includes:

a second voltage divider, external to said integrated circuit chip and connected across said DC potential source; said second voltage divider having a divider output terminal exhibiting a voltage division ratio intermediate the voltage division ratios exhibited at said first and third intermediate points on said first voltage divider; and

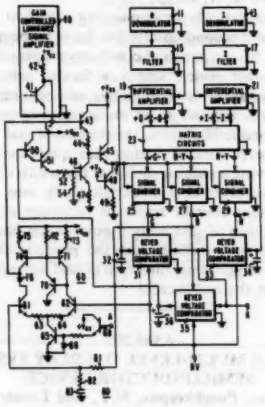
means, disposed external to said integrated circuit chip, coupled to said divider output terminal, and operative during appearances of said third pulse components, for determining the voltage level of said pulse train during said appearances of said third pulse components in accordance with the voltage appearing at said divider output terminal.

4,549,203

DC STABILIZATION SYSTEM

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,281
Int. Cl.[4] H04N 5/68
U.S. Cl. 358—34 **7 Claims**



1. In a color television receiver for displaying color images in response to composite video signals inclusive of respective image-representative luminance and chrominance components, said image-representative components being absent during horizontal blanking portions of successive line intervals within periodic field intervals, and also absent during the vertical blanking portion of each field interval, said receiver including: a color kinescope having a plurality of beam intensity control electrodes for controlling the intensity of a plurality of electron beams tracing a raster of scanning lines upon a viewing screen; means for automatically controlling the bias on the respective control electrodes during periodic bias control intervals encompassing a plurality of successive line intervals within each of said vertical blanking portions; a luminance signal channel for processing said luminance component and including a luminance signal translator; a chrominance signal channel for processing said chrominance signal component, and including means responsive to said chrominance signal component for developing a plurality of color-difference signal outputs; a signal combiner responsive to one of said color-difference signal outputs and to an output of said luminance signal translator for forming a first color signal; and means for apply-

ing said first color signal to one of said kinescope electrodes; a DC stabilization system comprising:

a first control loop for controlling the DC level of the output of said luminance signal translator including:

a first keyed voltage comparator, having a first input terminal coupled to receive a reference voltage and a second input terminal coupled to receive said first color signal, said first voltage comparator being keyed into operation during gating intervals within those horizontal blanking portions of line intervals which lie outside of said bias control intervals;

a second keyed voltage comparator, having a first input terminal coupled to receive said reference voltage and a second input terminal coupled to receive said first color signal, said second voltage comparator being keyed into operation only during said bias control intervals; and

means, coupled to said luminance signal translator and responsive to the outputs of said keyed voltage comparators, for opposing departures of the voltage attained by said first color signal voltage, during the periods of operation of said voltage comparators, from substantial equality with said reference voltage.

4,549,204

DIFFRACTION LIMITED IMAGING SYSTEMS

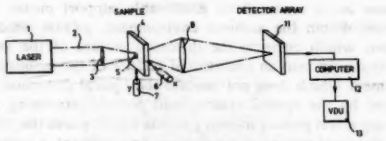
Mario Bertero, Viale Benedetto, Italy, and Edward R. Pike, Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 23, 1982, Ser. No. 443,083

Claims priority, application United Kingdom, Nov. 26, 1981, 8135759; Mar. 9, 1982, 8206923

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—93 **10 Claims**



1. An imaging system for examining object details having a size approximating the diffraction limit of said imaging system comprising:

means for illuminating a small area of an object with radiation;

a lens system for focusing the illuminated area of said object onto an image plane to give both a geometric image and a diffraction pattern of the object;

detector means for measuring the intensity or amplitude of the geometric image and diffraction pattern radiation in the image plane to obtain a matrix of information; and

means connected to said detector means for inverting said matrix of information thereby generating an information signal for reconstructing an image of said illuminated area containing details of the object.

4,549,205

AMPOULE INSPECTING METHOD

Yoshiki Misaki, Ashiya, and Seiji Owashi, Toyono, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

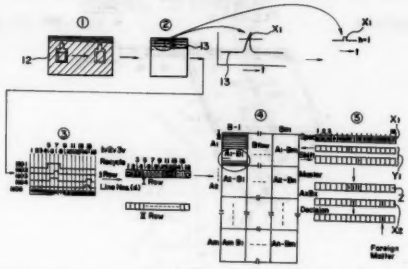
Filed May 4, 1983, Ser. No. 491,533

Claims priority, application Japan, May 10, 1982, 57-77746; May 10, 1982, 57-77747

Int. Cl.⁴ H04N *7/18*; B07C *5/00*; G01N *21/00*

U.S. Cl. 358—106 **17 Claims**

1. A method of inspecting the existence of foreign matter contained in fluid filled in a sealed container having a flaw, which comprises the steps of passing said container at an approximately constant speed before a television camera provided at a stationary position within an inspection region while the fluid in the container is turned; scanning the container by the use of said television camera sequentially at at least three positions of said container spaced at a given interval such that image signals each corresponding to a photograph partition are generated at each position and such that an abnormal signal is detected from among image signals of each of the photograph



partitions; setting a specified range where the abnormal signal in the image signals of a specific photograph partition has been transmitted for removing the flaw; and comparing the image signal of the particular photographic partition with the image signal of another photographic partition such that, when the abnormal signal in the image signals of another photograph partition exists beyond the specified range of said specific photograph partition, the presence of the foreign matter in the liquid within the container can be indicated by such an abnormal signal.

4,549,206

METHOD AND APPARATUS FOR EXAMINING PRINTED CIRCUIT BOARD PROVIDED WITH MINIATURIZED ELECTRONIC PARTS

Etsuji Suzuki, Tokyo; Shinichi Uno, Kawasaki; Kiyomu Chiyoda, Ayase, and Ryuhachirou Douji, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,924

Claims priority, application Japan, Oct. 19, 1981, 56-165707

Int. Cl.⁴ H04N *7/18*

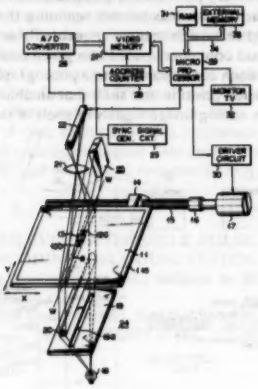
U.S. Cl. 358—106 **16 Claims**

1. An apparatus for detecting a position of an electronic part provided on one surface of a transparent printed circuit board, the electronic part being opaque and having an extremely low light reflection factor in comparison with that of a printed conductor provided on the printed circuit board, said apparatus comprising:

an illuminating means for radiating light onto the printed circuit board so that a level of transmitted and reflected first light obtained from a surface of said electronic part is minimum in comparison with that obtained from a remainder of the printed circuit board, and so that a predetermined level difference occurs between said first light and a transmitted and reflected second light obtained from a surface of said printed circuit board on which no electronic part and printed conductor are provided;

an image signal generating means responsive to a combina-

tion of the first and second light for generating an image signal of said printed circuit board; and



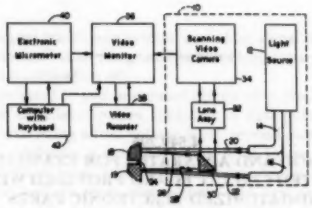
means for checking if the electronic parts are correctly mounted in a predetermined position on the printed circuit board in accordance with said generated image signal.

4,549,207

GAP MEASURING APPARATUS

Geoffrey Boshier, Greenbrier, Tenn., assignor to Avco Corporation, Nashville, Tenn.

Filed Apr. 9, 1984, Ser. No. 597,863
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—107 **7 Claims**



1. Apparatus for optically measuring the width of a gap between abutting panel surfaces of a multilayered structure with gaging being made on the sidewalls of previously drilled fastener holes, said apparatus comprising:

a video camera having an optical image input and a voltage wavetrain output representing the repetitive scanning of the input optical image;

a borescope sized for insertion into said fastener holes, said borescope mounted at the input of said video camera and including optical means for observing a test surface on the sidewall of said fastener hole into which said borescope is inserted;

light source means for providing illumination of said test surface including the use of fiber optics to project said light normally onto said test surface;

positioning eccentric sleeve means for providing optical alignment of said borescope with a continuum of specific test surface locations;

video monitoring means for visually displaying the information contained in the voltage wavetrain output of the video camera;

a video micrometer for superimposing two vertical cursors on the camera image displayed on the video monitor, said cursors being movable both with respect to each other and positionally as displayed on said monitor, said micrometer including means for providing a dimensional indication of cursor disposition one to the other; and

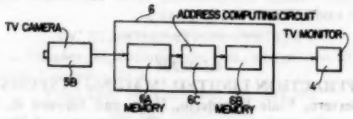
a control console for generating programmed instructions, cataloging measured data and translating the received information into a measure of the width of the gap between abutting panel surfaces.

4,549,208

PICTURE PROCESSING APPARATUS

Kohji Kamejima; Hiroshi Yamamoto, both of Ibaraki; Yoshiyuki Nakano, Hitachi; Masakatsu Fujie, Ibaraki; Taro Iwamoto, Mito, and Kazuo Honma, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,789
Claims priority, application Japan, Dec. 22, 1982, 57-223766
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—108 **8 Claims**



1. A picture processing apparatus for processing a facsimile picture of an ambient environment which is scanned through a wide angle optical system to eliminate optical distortion in the picture that is introduced by the optical system, comprising picture input means for producing a facsimile picture comprised of a plurality of pixels of a wide angle of view of the ambient environment which contains optical distortion introduced by the wide angle optical system, said picture input means being mounted on a movable support means which moves within the ambient environment, picture processing means which corrects the distorted picture of the ambient environment into an undistorted picture of the ambient environment which does not contain the optical distortion introduced by the optical system, said picture processing means having a first picture memory means which stores the pixels of the distorted picture of the ambient environment, a computing means which produces an undistorted picture of the ambient environment by eliminating and compensating the distortion of the picture stored in said first picture memory means for each stored pixel of the distorted picture by computing an address for storage of each stored pixel which will produce the undistorted picture, and a second picture memory means which stores the undistortioned picture produced by said computing means by storing each pixel at the computed address to produce the undistorted picture, display means for displaying the undistorted picture of the wide angle of view from said picture processing means; and said picture processing means and the display means are installed at a position which is remote from the movable support means, and said picture input means and said picture means are coupled together by communication means.

4,549,209

X-RAY IMAGE CONVERTER SYSTEM

John K. Grady, 111 Flough Rd., Harvard, Mass. 01460, and Richard E. Rice, Arlington, both of Mass., assignors to John K. Grady, Littleton, Mass.

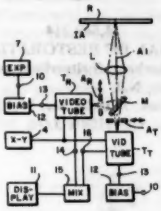
Filed Jul. 6, 1983, Ser. No. 511,226
Int. Cl.[4] H04N *7/18;* G03B *41/16;* H01J *40/14*
U.S. Cl. 358—111 **21 Claims**

1. An image converter system viewing an image area having a finite range of light intensities comprising:

electro-optical means viewing the image area including optical means simultaneously separating the image into at

least two further images, the electro-optical means further incluidng at least two electro-optical devices viewing the same image area and respectively responsive to light received from the area simultaneously to generate corresponding electrical output signals; and

each device including a bias electrode controlling the signal gain of the device,



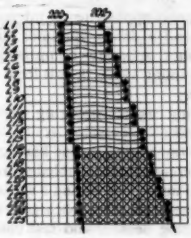
characterized by variable bias means connected to the bias electrode of each electro-optical device for adjusting the gain of each device so that one device generates output signals whose amplitude corresponds to one portion of the range light intensities at the image area, and another device generates output signals whose amplitude corresponds to another range portion of image area light intensities.

4,549,210

HOLE-FILL TECHNIQUE FOR DIAGNOSTIC ULTRASOUND IMAGING SYSTEMS

Mark J. Dulapa, Denver, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Sep. 27, 1983, Ser. No. 536,415
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—112 **8 Claims**



1. In an ultrasonic diagnostic imaging system, including a source of ultrasonic vectors and a two-dimensional display for displaying ones of said vectors in substantially a y direction; apparatus for providing pixel information in substantially the x direction between data points of said vectors comprising:

means responsive to said source of vectors, for producing a sequence of pixel values in said x direction, including valid pixel values representative of said vector information separated by hole pixel values which are not representative of said vector information;

means for variably setting a maximal number of hole pixel values which are to be interpolated between valid pixel values;

means, responsive to said sequence of pixel values, for tagging pixel values as either valid or hole pixel values;

means, responsive to the tags of a sequence, for comparing the length of a sequence of hole pixel values between valid pixel values with said maximal number; and

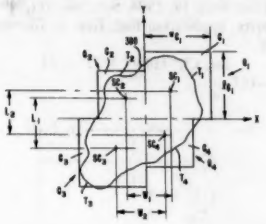
means, responsive to said comparing means, for filling in said hole pixel sequence with interpolated values when said sequence length is less than said maximal number, and for blanking said hole pixel sequence when said sequence length is greater than said maximal number.

4,549,211

FOUR-QUADRANT GATE-SIZING TECHNIQUE

David Assael, Thousand Oaks, and Lawrence M. Ruben, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Mar. 31, 1983, Ser. No. 480,967
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—126 **13 Claims**



1. In an imaging, gated-video tracking system having an ascertained track aimpoint, a method for adaptively sizing the system tracking gate to a target image applied in the vicinity of the aimpoint, this method comprising the steps of:

(A) establishing, with respect to the aim-point, a four-quadrant frame of reference, with the established reference frame thereby effectively converting the applied image into a composite target comprising the union of four target-segments;

(B) with respect to the established reference frame, establishing four subgates, one within each reference-frame quadrant, with a composite-tracking-gate union of the four subgates thereby comprising the overall system tracking gate; and

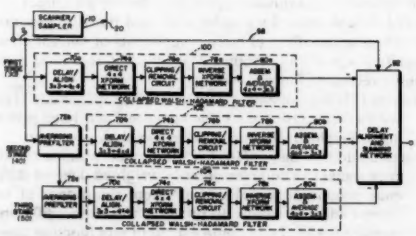
(C) conformance-optimizing the composite tracking gate with respect to the composite target by conformance-optimizing the subgates with respect to the associated target-segments under the constraint that the aspect ratios of all four subgates are to remain equal.

4,549,212

IMAGE PROCESSING METHOD USING A COLLAPSED WALSH-HADAMARD TRANSFORM

Bryce E. Bayer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1983, Ser. No. 522,278
Int. Cl.[4] H04N *5/21, 5/14*
U.S. Cl. 358—167 **12 Claims**



1. In an image processing method of the type using a Walsh-Hadamard transformation, in which image signals representa-

tive of the light value of elements of the image are grouped into arrays of signals prior to transformation, the improvement wherein the signals from each array are mapped into a larger array such that one or more image signals appear two or more times in the larger array and the signals constituting the larger array are then transformed in accordance with the Walsh-Hadamard combinations characteristic of the larger array.

4,549,213

SYSTEM FOR REDUCTION OF NOISE IN A TELEVISION SIGNAL

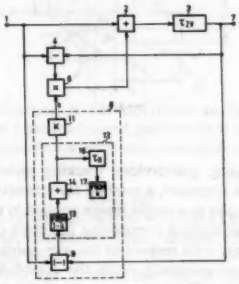
Gerhard Illetschko, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,849

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319438

Int. Cl.[4] H04N *5/21, 5/14*

U.S. Cl. 358—167 **2 Claims**



1. Apparatus for reducing noise in digital television signals comprising means (3) for delaying digital television signals for the period of a television frame and having an input and an output, means (4) connected to a source (1) of first subtraction digital television signals and the output of said delaying means (3) for producing difference signals corresponding to the difference between signals simultaneously present at said source and at said delay means output, multiplier means (6) for multiplying said difference signals by a correction factor (k) of a magnitude between 0 and 1 to produce a weighted difference signal, addition means (2) for adding said weighted difference signal to each digital television signal provided by said source (1) to produce a sum signal and furnishing the same to said delay means input, means (g) including second subtraction means connected to said delaying means output and to said source, for producing a difference magnitude signal independent of sign, a function generator (11) for producing a signal representative of said correction factor (k) and furnishing the same to said multiplier means (6), and for varying said correction factor signal in response to a control signal input, and variable transmission characteristic filter means responsive to said difference magnitude signal and having an output connected to said control signal input of said function generator for reducing the effect of noise components of said difference magnitude signal on said control signal input, said filter means being a recursive filter including:

means (13) for weighting said difference magnitude signal with a factor (1-k') of a value between 0 and 1 and providing a weighted difference value signal at its output;

second addition means (14) for adding said weighted difference signal to a complementarily weighted delayed difference magnitude signal derived from the output of said second addition means, to produce a modified difference magnitude signal said control input of said function generator (11);

second delaying means for delaying said modified difference magnitude signal by a period of time related to the time difference in a digital television signal between digital signals representative of adjacent pixels; and

means (17) for weighting the output of said second delaying means to an extent complementary to the weighting of said difference magnitude signal and providing said weighted delayed signal to said second addition means (14).

4,549,214

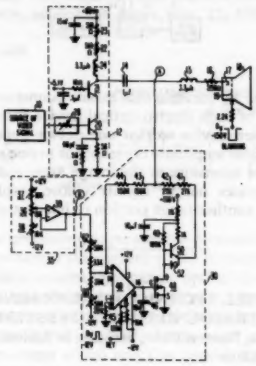
VIDEO SIGNAL DC RESTORATION CIRCUIT

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 7, 1983, Ser. No. 549,478

Int. Cl.[4] H04N *5/16, 5/06*

U.S. Cl. 358—172 **17 Claims**



1. In a video signal processing system including an image reproducing device for displaying video information in response to video signals applied to an intensity control drive electrode thereof; and a driver amplifier stage including an output load impedance, apparatus comprising:

means for AC coupling video signals from an output of said driver amplifier;

a source of keying signals occuring during video signal blanking intervals;

video signal DC restoration means having an input circuit including a reference input coupled to a reference potential and a signal input, and having a signal output coupled to said signal input via a feedback path exclusive of said image reproducing device, said restoration means being rendered operative in response to said blanking interval keying signals;

means for passively coupling video signals from said AC coupling means to said intensity control electrode via a drive signal path; and

means for coupling said feedback path of said restoration means to said drive signal path.

4,549,215

LOW NOISE BLACK LEVEL REFERENCE FOR CCD IMAGERS

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 7, 1983, Ser. No. 482,855

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **29 Claims**

1. A clamping arrangement for a television imager, comprising:

pixel-rate clamping means coupled to the imager for receiving therefrom a television signal comprising first pixel intervals during which the television signal is representa-

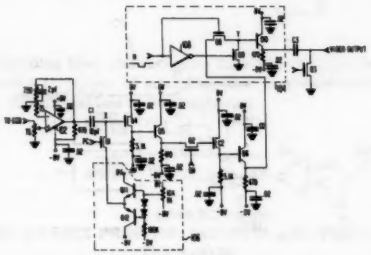
tive of light levels alternating with reset signal intervals not representative of light levels, for clamping the television signal to a reference potential during said reset signal intervals;

line-rate clamping means for clamping signals applied to an input terminal of said line-rate clamping means, said clamping means operating during a portion of each horizontal line of said television signals without the active portion of said horizontal line for clamping said television signal to a reference potential during said portion of each horizontal line;

direct-current-blocking means coupling said line-rate clamping means to said pixel-rate clamping means for ac-coupling said signal whereby noise occuring during said portion of each horizontal line without the active portion causes said line-rate clamping means to add to the television signal a low-frequency noise component which appears as horizontal streaking;

wherein the improvement comprises:

first switch means coupled to the input side of said direct-current-blocking means for coupling said input side of said direct-current-blocking means to a point of reference potential during an interval including said portion of each horizontal line whereby said line-rate clamping means operates during a time of reduced noise, said low-frequency noise component is attenuated and said streaking is reduced.

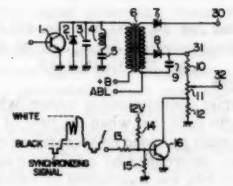


4,549,216

FOCUSING VOLTAGE OUTPUT CIRCUIT FOR CATHODE RAY TUBE

Ikuo Yuki, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,069
Claims priority, application Japan, Dec. 14, 1982, 57-217876
Int. Cl.⁴ H04N *5/68*
U.S. Cl. 358—242 **2 Claims**



1. In a focusing voltage output circuit for a cathode ray tube wherein focusing voltage derived from a fly-back transformer having a first output terminal for anode voltage of the cathode ray tube and a second output terminal for the focusing voltage, the improvement which comprises:

an input terminal for receiving a video signal or a beam current flowing in said cathode ray tube; and

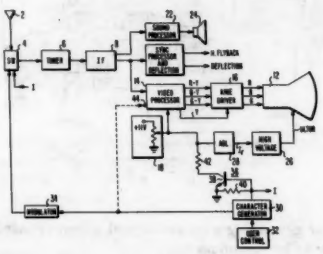
a variable impedance circuit connected between said second output terminal and a focusing voltage output terminal wherein said variable impedance circuit changes its impedance with a magnitude of said input signal applied to said input terminal.

4,549,217

AUTOMATIC CONTRAST REDUCTION CIRCUIT FOR A TELETEXT OR MONITOR OPERATION

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1983, Ser. No. 536,713
Int. Cl.⁴ H04N *5/68*
U.S. Cl. 358—243 **2 Claims**



1. In a system including a switching means for supplying either a conventional television video signal representative of a televised scene or auxiliary video signals representative alphanumeric text or graphics, a signal processing channel for processing said conventional or auxiliary video signals and an image reproducing device for reproducing the televised scene in response to said processed conventional video signal or the alphanumeric text or graphics in response to said processed auxiliary video signals, and means for sensing current drawn by said image reproducing device which is responsive to the amplitude characteristics of said processed conventional and auxiliary signals, apparatus for modifying said current drawn by said image reproducing device comprising:

means coupled to said signal processing channel and said sensing means for modifying the signal translation characteristics of said signal processing channel to reduce the level of said current drawn by said image reproducing device;

means for generating a control signal;

said switching means supplying said auxiliary video signals to said video signal processing channel in response to said control signal; and

means coupled to said signal translation characteristic modifying means and responsive to said control signal for causing said signal translation characteristic modifying means to further reduce the amplitude characteristics of said processed auxiliary signals whenever alphanumeric text or graphics are displayed.

4,549,218

ON-SCREEN DISPLAY

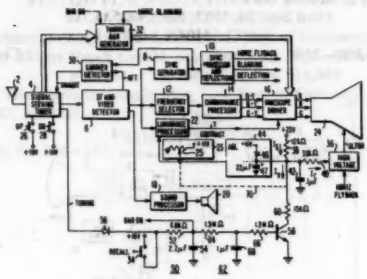
Ronald R. Norley; Gene K. Sendelweck, both of Indianapolis, Ind., and Keming J. Chen, San Diego, Calif., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1983, Ser. No. 536,712
Int. Cl.⁴ H04N *5/68*
U.S. Cl. 358—243 **15 Claims**

1. In a system including a signal processing channel for processing video signals representative of conventional televised scenes and auxiliary signals representative of graphics and including an image reproducing device for reproducing conventional scenes in response to said processed video signals and graphics in response to said processed auxiliary signals,

and means for sensing current drawn by said image reproducing device which is responsive to the amplitude characteristics of said processed video and auxiliary signals, apparatus for modifying said current drawn by said image reproducing device comprising:

means coupled to said signal processing channel for modifying the signal translation characteristics of said signal processing channel to reduce the level of said current drawn by said image reproducing device;



means for generating a control signal whenever said graphics are to be reproduced;

means coupled to said signal translation characteristic modifying means and responsive to said control signal for controlling said signal translation characteristic modifying means to further reduce the characteristics of said processed video signal in said signal processing channel whenever graphics are to be displayed.

4,549,219

IMAGE INFORMATION TRANSMISSION SYSTEM

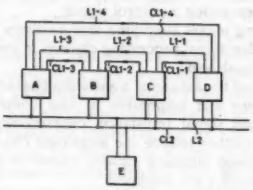
Yasuhiko Sue; Masao Ariga, both of Yokohama; Yasuyuki Tamura, Kawasaki; Nao Nagashima, Yokohama; Ken Miyagi, Yokohama; Masaki Nakaoka, Yokohama, and Masashi Suda, Iruma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,043

Claims priority, application Japan, Oct. 12, 1981, 56-162368

Int. Cl.⁴ H04M *1/32*

U.S. Cl. 358—257 **14 Claims**



1. An image information transmission system comprising:

a plurality of image information processing means for processing image information;

an image information transmission line for transmitting said image information among any of said plurality of image information processing means; and

a control information transmission line separate from said image information transmission line, for transmitting control information among any of said plurality of image information processing means, wherein said control information is related to the image information processing by said image information processing means, and wherein each of said image information processing means is connected in parallel with each of the other said image information processing means with respect to said image information transmission line.

4,549,220

APPARATUS FOR PROCESSING IMAGE INTO BINARY DATA

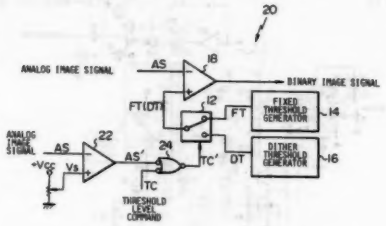
Kazuhiro Suzuki, Shizuoka, Japan (now by change of name from Kazuhiro Watai), assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,111

Claims priority, application Japan, Mar. 10, 1982, 57-37549

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—283 **4 Claims**



1. An apparatus for processing an analog image data signal into a binary image data signal, comprising:

a switch means for selecting one threshold level out of a plurality of threshold levels in response to a command contained in a threshold level command signal, said threshold levels including at least a constant threshold level and a variable threshold level;

a comparator means for comparing a level of the analog image data signal with one of the threshold levels selected by the switch means and selectively delivering two signals of different levels in dependence upon the result of the comparison; and

a specified threshold level changing means for comparing a level of the analog image data signal with the level of a predetermined reference signal and changing the command contained in the threshold level command signal from a variable threshold level command into a constant threshold level command only when the image data signal level is higher than the reference signal level and the command is the variable threshold level command.

4,549,221

VIDEO SIGNAL TRANSMITTING SYSTEM

Tadashi Yamamoto, and Haruhiko Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,082

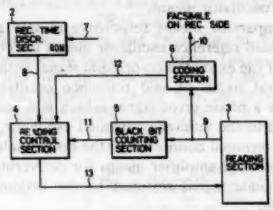
Claims priority, application Japan, Jan. 20, 1982, 57-6129

Int. Cl.⁴ H04N *1/32*

U.S. Cl. 358—288 **4 Claims**

1. In a facsimile communication system wherein transmission is carried out such that when the time of transmission of lines of video signals provided by scanning an original image is shorter than that determined by a facsimile on the signal receiving side, fill bits are transmitted in succession with the video signals so that the time of transmission of each line is adjusted to that determined by the facsimile on the signal receiving side, the improvement comprising; means on the signal transmitting side for discriminating a period of time required for the facsimile on the signal receiving side to record video signals per line for each line to be transmitted as a function of its video content and, means to transmit the video signals of each line employing the period of time thus discriminated as the time of transmission, wherein said discriminating

means of said signal transmitting side comprises a recording time discriminating section receiving as an input data from said facsimile on the receiving side indicative of its minimum one



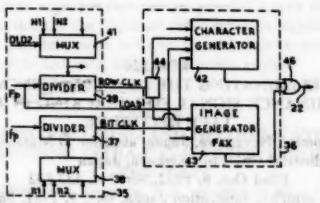
line recording time, said recroding time discriminating section producing an output of recording time as a function of the video content per line to be transmitted.

4,549,222

DOT MATRIX PRINTING METHOD AND PRINTER THEREFOR

Giuseppe Fogaroli, Ivrea, and Giuseppe Coli, Pavone, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 2, 1982, Ser. No. 471,349
Claims priority, application Italy, Mar. 4, 1982, 82 67245
Int. Cl.⁴ H04N *1/22*
U.S. Cl. 358—296 **6 Claims**



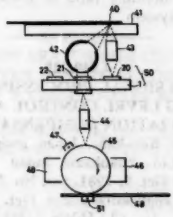
1. A dot printer operable for printing an image recorded in accordance with a pair of predetermined definitions associated to a pair of perpendicular directions on the original image, said printer including a printing element conditionable at a control frequency for printing the dots in accordance with a matrix having along at least one of said directions a definition multiple of the corresponding definition by which the original image has been recorded, signal generating means for generating electrical signals corresponding to the bits of the recorded image, signal extracting means conditionable for extracting said signals from said signal generating means in sequence, a pair of frequency generating circuits associated with said directions and arranged for selectively defining in the corresponding direction said multiple, each circuit conditioning said extracting means to extract said signals from said signal generating means with an extraction frequency such that the ratio of said control frequency to said extraction frequency is equal to said multiple, and a pair of frequency dividers associated with said directions and each one controlled by said frequency generating circuit for so conditioning said extracting means, whereby said printing element prints in said directions for each extracted signal a number of dots equal to said multiple so that the images recorded upon being scanned according to one of a plurality of definitions is printed according to said multiple definition.

4,549,223

READING, PRINTING AND COPYING DEVICE

Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,490
Claims priority, application Japan, Nov. 4, 1982, 57-193628
Int. Cl.⁴ H04N *1/30*
U.S. Cl. 358—300 **11 Claims**



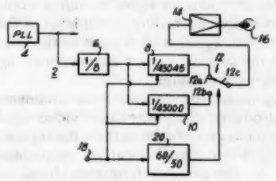
10. A reading, printing and copying device, comprising:
a platen for holding an original document;
a transparent substrate;
a light source disposed between said platen and said substrate;
photosensitive copying means disposed on the side of said substrate opposite said light source;
liquid crystal shutter means, fabricated on said substrate and responsive to control signals for selectively passing light from said light source to said photosensitive copying means; and
image sensing means, fabricated on said substrate and responsive to light from said light source reflected from the original document for providing said control signals to said liquid crystal shutter means.

4,549,224

DIGITAL VIDEO TAPE RECORDER THAT CAN BE USED WITH DIFFERENT TELEVISION SYSTEMS

Masato Nakamura, and Sohei Takemoto, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,802
Claims priority, application Japan, Apr. 23, 1982, 57-69427
Int. Cl.⁴ H04N *9/491*
U.S. Cl. 358—310 **10 Claims**



1. Apparatus for recording information signals in a plurality of oblique tracks on a record medium, comprising:
means for generating a reference signal having a reference frequency;
first means for producing a first control signal corresponding to an information signal having a first format in response to said reference signal;
second means for producing a second control signal corresponding to an information signal having a second, different format in response to said reference signal;
transducer means for recording, for each of said plurality of parallel tracks one of said first control signal and said second control signal in a control track extending longitudinally on said record medium; and

switch means for switching one of said first control signal and said second control signal to said transducer means in response to said information signal to be recorded.

4. Apparatus according to claim 1; in which said first means includes frequency dividing means for frequency-dividing said reference signal to produce said first control signal.

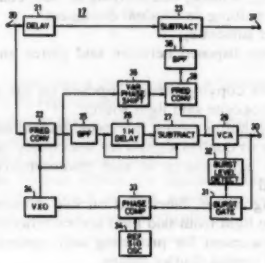
5. Apparatus according to claim 4; in which said frequency dividing means divides the frequency of said reference signal with a frequency-dividing ratio of 1/45045 for use with an NTSC television system.

4,549,225

COLOR VIDEO SIGNAL PROCESSING CIRCUIT FOR PERFORMING LEVEL CONTROL AND TIME AXIS DEVIATION COMPENSATION

Yasuaki Watanabe, Kasukabe, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 9, 1981, Ser. No. 310,131
Claims priority, application Japan, Oct. 13, 1980, 55-142753
Int. Cl.[4] H04N *9/493*
U.S. Cl. 358—316 **2 Claims**



1. A reproduced color video signal processing circuit in a reproducing apparatus for reproducing a composite color video signal from a rotary recording medium on which the composite color video signal has been recorded, wherein the composite color video signal comprises a luminance signal and a carrier chrominance signal which has been frequency-converted into a low frequency band which is lower than its original frequency band, and then combined with the luminance signal in a commonly shared band within a part of the frequency band of the luminance signal, and wherein the level of the carrier chrominance signal including a color burst signal has been controlled according to the level of the original carrier chrominance signal with respect to the color burst signal included in the original carrier chrominance signal, said processing circuit comprising:

separating means for separating the luminance signal from the reproduced composite color video signal,

obtaining means for obtaining from the reproduced composite color video signal a carrier chrominance signal restored to the original frequency band, said obtaining means having:

a voltage controlled oscillator,

mixing means for mixing the reproduced composite video signal with an output signal of said voltage controlled oscillator,

filter means coupled to said mixing means for filtering frequency components from the output signal of the mixing means, said frequency components lying in the original frequency band of the carrier chrominance signal,

comb filter means responsive to said filter means for filtering the carrier chrominance signal from the output signal of the filter, the carrier chrominance signal being restored to the original frequency band,

voltage controlled amplifier means coupled to the comb filter means,

gating means responsive to said comb filter means for extracting the color burst signal from the output signal of the comb filter means, said gating means receiving the output signal of the comb filter means via the voltage controlled amplifier,

reference oscillator means,

phase comparator means responsive to said gating means and to said reference oscillator means for comparing the phase of the extracted color burst signal with the phase of an output signal of said reference oscillator means to produce a phase error signal which is a control voltage supplied to the voltage controlled oscillator, and

an output terminal connected to the output side of the voltage controlled amplifier means for delivering the carrier chrominance signal restored to the original frequency band, and

the separating means having:

detecting means responsive to the gating means for detecting the level of the color burst signal extracted by the gating means, the gain of said voltage controlled amplifier means being controlled responsive to the output signal of the detecting means for holding a substantially constant level of the color burst signal in the output signal,

frequency-converting means jointly responsive to at least a phase based on the output signal of the voltage controlled oscillator and to the output signal of the comb filter for again frequency-converting the carrier chrominance signal from the original frequency band to the low frequency band; and

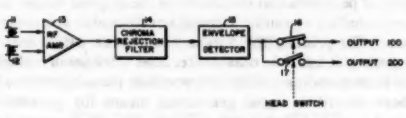
subtracting means responsive to said frequency-converting means for subtracting the output signal of the frequency converting means from the reproduced composite color video signal in order to obtain the luminance signal.

4,549,226

ELIMINATING THE LOW-FREQUENCY CHROMINANCE SIGNAL FOR TRACKING IN A VIDEO TAPE RECORDER

Masao Tomita, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 8, 1982, Ser. No. 433,532
Claims priority, application Japan, Oct. 9, 1981, 56-161668
Int. Cl.[4] G11B *21/10*; H04N *5/92*
U.S. Cl. 358—328 **3 Claims**



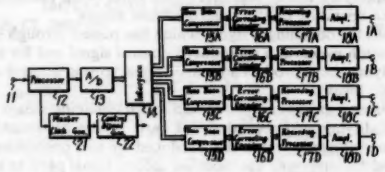
1. In an automatic tracking system which is used in a video tape recorder having two rotary heads different in azimuth from each other and which moves the rotary heads to keep them on-track according to a tracking error signal obtained from an envelope of a video signal which is reproduced by the rotary heads and is composed of a chrominance signal converted to a low-frequency and a luminance signal, said envelope being detected by an envelope detecting means coupled to the rotary heads the improvement comprising a filter means disposed between said heads and said envelope detecting means for eliminating the low-frequency converted chrominance signal so as to increase the S/N ratio of the tracking error signal with respect to a cross-talk signal, so that said envelope detected by said envelope detector substantially includes only an envelope of the luminance signal, whereby the S/N of the tracking error signal is improved.

4,549,227

METHOD AND APPARATUS FOR RECORDING A DIGITAL INFORMATION SIGNAL IN PARALLEL TRACKS ON A RECORD MEDIUM WITHOUT GUARD BANDS BETWEEN AT LEAST SOME ADJACENT TRACKS

Yoshitaka Hashimoto, Chofu, and Takeo Eguchi, Hatano, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 28, 1980, Ser. No. 211,280
Claims priority, application Japan, Nov. 28, 1979, 54-154116
Int. Cl.[4] H04N 9/491, 9/44, 5/78
U.S. Cl. 358—328 16 Claims



9. A method of recording a video signal on a magnetic tape comprising the steps of:

converting the video signal into digital form;

distributing respective portions of the digitized video signal to at least two channels;

code converting the respective portions of said digitized video signal distributed to each channel so as to reduce low frequency components of said digitized video signal; and

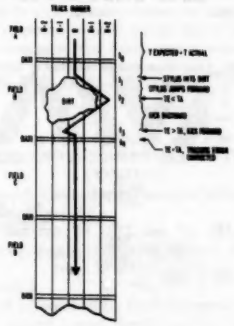
recording the respective portions of said digitized video signal in a plurality of parallel tracks extending obliquely on said magnetic tape without guard bands between at least some adjacent ones of the parallel tracks and with said portions of the digitized video signal in adjacent ones of the parallel tracks without guard bands therebetween being recorded with different azimuth angles.

4,549,228

VIDEO DISC ENCODING AND DECODING SYSTEM PROVIDING INTRA-FIELD TRACK ERROR CORRECTION

Charles B. Dieterich, Kingston, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1983, Ser. No. 556,444
Int. Cl.[4] H04N 5/781; G11B 21/10
U.S. Cl. 358—342 15 Claims



1. A method for forming a video disc recording signal for facilitating intra-field track error correction upon subsequent playback of video disc records recorded with said disc recording signal comprising the steps of:

(a) providing a video signal and a data sequence representative of field numbers of said video signal;

(b) deriving a subset of said data sequence;

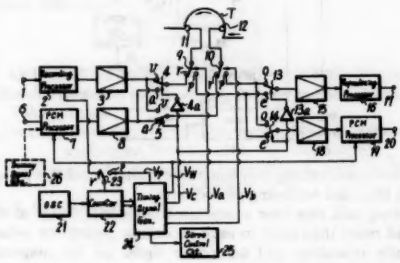
(c) combining said video signal, said data sequence and said subset of said data sequence to form said recording signal with the subset data sequence conveying partial tracking information repeatedly within each field of said recording signal.

4,549,229

METHOD AND APPARATUS FOR COMPENSATING FOR TAPE JITTER DURING RECORDING AND REPRODUCING OF A VIDEO SIGNAL AND PCM AUDIO SIGNAL

Kenji Nakano; Hisayoshi Moriwaki, and Takao Takahashi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,517
Claims priority, application Japan, Feb. 1, 1982, 57-14655; Feb. 18, 1982, 57-14656
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—8 19 Claims



1. Apparatus for recording an information signal comprised of a video signal and an audio signal in a plurality of successive tracks on a record medium, said apparatus being subject to jitter fluctuations having a maximum time fluctuation duration corresponding to a maximum jitter fluctuation, said apparatus comprising:

converting means for converting said audio signal into digital form;

compression means for compressing said digitized audio signal such that the compressed digitized audio signal to be recorded in any one of said tracks has a first time duration;

compensation means for providing a dummy signal for a second time duration at least as long as said maximum time fluctuation duration; and

transducer means for recording said video signal in a main section of each track and said compressed digitized audio signal and said dummy signal in an overscan section of each track, said dummy signal being recorded in the overscan portion of each track at least one of before and after said compressed digitized audio signal recorded therein.

4,549,230

REDUNDANTLY AND ASYNCHRONOUSLY RECORDING AN INFORMATION SIGNAL

Kentaro Odaka, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 564,891
Claims priority, application Japan, Dec. 29, 1982, 57-233194
Int. Cl.[4] G11B 5/00, 15/02
U.S. Cl. 360—8 16 Claims

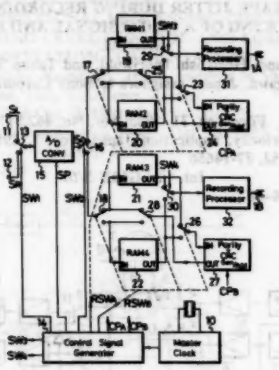
1. A method of recording an analog signal on a magnetic medium using a recording head that periodically scans the

magnetic medium in discrete traces, the method comprising the steps of:

providing a digital signal corresponding to a predetermined real-time signal period of the analog signal;

scanning said magnetic medium with the recording head during at least one recording period corresponding to each predetermined real-time signal period, said at least one recording period being shorter than said real-time signal period;

adding additional data periodically to said digital signal to provide a composite digital signal;



time-base compressing said composite digital signal to a period less than said recording period; and

supplying said time-base compressed composite signal to the head more than once in each recording period for redundantly recording said composite signal on the magnetic medium during a recording period, whereby a reproduction of the complete composite signal from the magnetic medium is obtainable without controlling the phase relation between the recording head and the magnetic medium during the recording.

4,549,231

SIGNAL REPRODUCING APPARATUS HAVING MEANS FOR MODIFYING A PRE-RECORDED CONTROL SIGNAL

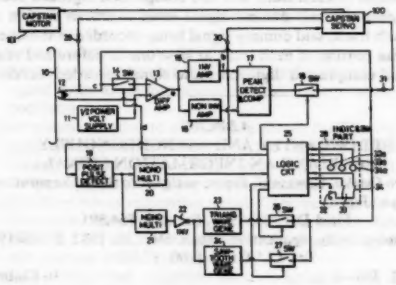
Yasuomi Namiki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 4, 1982, Ser. No. 374,772

Claims priority, application Japan, May 11, 1981, 56-70372; May 11, 1981, 56-70373

Int. Cl.⁴ G11B *27/02*; H04N *5/78*

U.S. Cl. 360—14.2 **10 Claims**



1. A signal reproducing apparatus which comprises:

a control head for recording and reproducing a control signal recorded in a control track on a tape;

control circuit means for controlling functions of said reproducing apparatus in response to a pre-recorded control signal which is reproduced from the tape by said control head, said pre-recorded control signal being made up of first and second signal parts comprising positive and negative pulses, said first signal parts being only said positive pulses;

switch means coupled to said control head for passing only said first signal parts of the pre-recorded control signal which is reproduced by said control head during a signal modifying mode, said first signal parts being essential to the operation of said control circuit means;

means for obtaining a signal which has passed through said switch means as a reproduced control signal and for supplying the reproduced control signal to said control circuit means;

modifying means coupled to said signal obtaining means for modifying said second signal parts of the pre-recorded control signal which is reproduced by said control head and for supplying the modified second signal parts to said control head, said second signal parts not being essential to the operation of said control circuit means, said modifying means comprising means for forming triangular waves within intervals other than intervals in which said positive pulses exist, means for applying said triangular waves to said control head, said control head responding to said triangular waves by erasing signal parts corresponding to said negative pulses on said control track;

means for intermittently placing said control head in reproducing and recording states during the signal modifying mode in order to record the modified second signal parts received from said modifying means in place of the second signal parts of said pre-recorded control signal;

restoring means comprising means for generating sawtooth waves having parts with steep level change; and

means for applying the generated sawtooth waves to said control head, and said control head supplied with said sawtooth waves recording negative pulses onto said control track in response to parts of said sawtooth waves having steep level change.

4,549,232

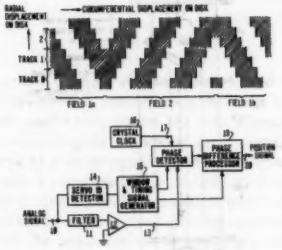
PHASE MODULATED SERVO SYSTEM

Frederick E. Axmear, and David W. Collins, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,647

Int. Cl.⁴ G11B *5/55, 5/58*

U.S. Cl. 360—77 **15 Claims**



1. A phase modulated servo for a disk file having rotating storage media presenting data surfaces and a transducer which is substantially radially moveable between track positions comprising:

two constant frequency fields recorded on a media data surface having differing, radially varying phase;

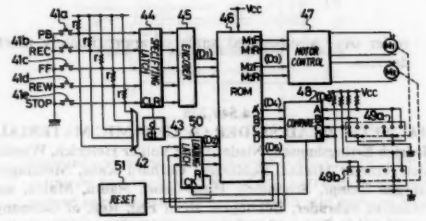
a source of pulses running at said constant frequency; and detecting means for detecting the phase of each of said two constant frequency fields with respect to the pulses generated by said source of pulses.

4,549,233

POSITION CONTROL SYSTEM

Hiroshi Teranishi, Nagareyama; Takashi Nakatsuyama, Sakura, and Masaomi Inagaki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,068
Claims priority, application Japan, Jun. 30, 1982, 57-111664
Int. Cl.[4] G11B *15/18, 19/02;* **H02P** *7/60, 1/22*
U.S. Cl. 360—90 **20 Claims**



1. A position control system for a mechanism capable of being placed by a drive means in any one of a plurality of specified positions, comprising:

specifying means for providing a specified position signal having a value representative of a specified position to be occupied by the mechanism;

loading means for providing a present position signal having a value representative of the position presently occupied by the mechanism;

memory means for receiving said specified and present position signals and generating in response thereto a control signal for controlling the drive means for moving the mechanism into a particular position and a comparison signal and a particular position signal having respective values representative of said particular position;

a position detector for providing a detection signal having a predetermined value when the mechanism is in said particular position; and

comparing means for providing a match signal to said loading means when the values of said detection signal and said comparison signal have a predetermined relation, wherein said loading means provides said particular position signal to said memory means as said present position signal in response to said match signal and said control signal de-energizes the drive means when the values of said present position signal and said specified position signal have a predetermined relation.

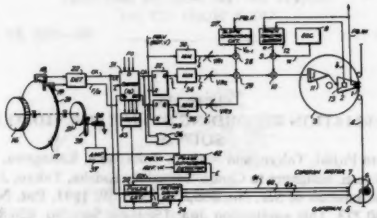
4,549,234

METHOD AND APPARATUS FOR TRACKING CONTROL

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,429
Claims priority, application Japan, Feb. 4, 1981, 56-25931
Int. Cl.[4] G11B *21/00*
U.S. Cl. 360—10.2 **32 Claims**

1. A method of controlling the movement of a record medium having record tracks therein which are scanned by a transducer, said tracks being skewed relative to the direction in which said record medium is moved and said transducer being driven to scan traces generally disposed at an angle to said tracks, said method comprising the steps of commanding said record medium to be transported; detecting the phase differences between a record track being scanned and the trace of said transducer when said record medium has been commanded to be transported by a predetermined incremental amount; transporting said record medium in response to said command; deflecting said transducer in a direction generally transverse with respect to said track being scanned and by an



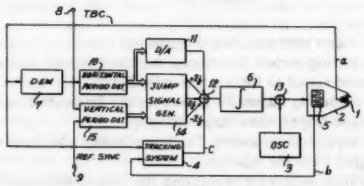
amount which depends in part on the position of said transducer along the length of said track being scanned, whereby said angle is minimized; and adjusting the speed at which said record medium is transported as a function of said detected phase difference.

4,549,235

APPARATUS FOR REPRODUCING VIDEO SIGNALS

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 445,848, Dec. 1, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,669
Claims priority, application Japan, Dec. 4, 1981, 56-194074
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—10.2 **6 Claims**



1. Apparatus for reproducing video signals recorded on a recording medium in successive parallel tracks having a predefined pitch and which are skewed relative to a direction of movement of said medium, said apparatus comprising:

signal transducer means repeatedly scanning said recording medium in a direction along said tracks for reproducing the video signals from said successive tracks upon said movement of said medium at a predetermined speed;

transducer deflecting means responsive to drive signals for deflecting said signal transducer means in a direction transverse to the direction of said tracks;

means for generating a plurality of types of jump signals of different respective amplitudes to cause said transducer deflecting means to select the track scanned by said signal transducer means, each of said types of jump signals corresponding to a displacement of said signal transducer means by a respective number 2m of track pitches, wherein m is an integer;

phase detector means for detecting a phase signal included in said video signal reproduced by said signal transducer means and generating reproduced phase signals therefrom;

speed detector means for detecting said predetermined speed of said medium and generating detected speed signals in response thereto;

selector means responsive to control signals for selectively

supplying one of said types of jump signals to said transducer deflecting means when said signal transducer means reaches an end of each of said successive tracks; and

controller means responsive to said reproduced phase signals and said detected speed signals for generating said control signals for said selector means.

4,549,236

INFORMATION RECORDING DEVICE FOR VIDEO AND SOUND

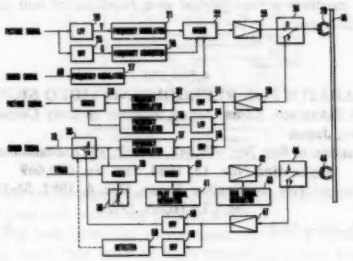
Makoto Fujiki, Tokyo, and Makoto Takayama, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 335,339, Dec. 29, 1981, Pat. No. 4,480,273. This application Jun. 15, 1984, Ser. No. 620,867

Claims priority, application Japan, Jan. 7, 1981, 56-1334

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—19.1 **26 Claims**



1. A video tape recorder comprising:

first mixing means for mixing a picture signal and a first sound signal to form a first mixed signal;

first recording means for recording the first mixed signal on a tape-shaped recording medium;

first reproducing means for reproducing the first mixed signal from the medium;

separating means for separating the first sound signal from the first mixed signal reproduced by said first reproducing means;

second mixing means for mixing the first sound signal separated by said separating means with a second sound signal from another source to form a second mixed signal; and

second sound recording means for recording the second mixed signal on the medium.

4,549,237

TAPE MACHINE

Seigo Uehara, Fujisawa; Hiroshi Yamanouchi, Tokyo, and Mitsugu Kuji, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,854

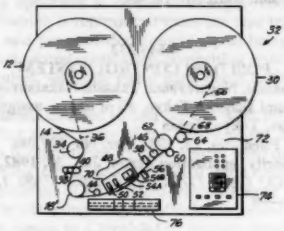
Int. Cl.⁴ G11B *27/14, 15/60*

U.S. Cl. 360—71 **13 Claims**

1. Apparatus for use with a tape recorder of the kind having a tape supply reel and a tape take-up reel mounted on a top plate and a tape drive for transporting tape therebetween, comprising;

tape measuring means having a metering roller in contact with said tape for providing an indication of the length of tape that is transported; and

tape guide means contacting said tape and arranged on said top plate for causing said tape to contact said metering



roller over a subtended angle of approximately ninety degrees.

4,549,238

MAGNETIC HEAD SLIDER OF CERAMIC MATERIAL

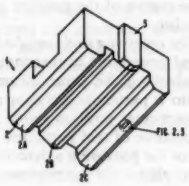
Friedrich Ertingshausen, Nieder-Olm; Volker Heinrich, Wiesbaden; Holger Hinkel, Böblingen; Gerhard Kaus, Mötzingen; Jürgen Kempf, Schönaich; Hans-Georg Nauth, Mainz, and Manfred Schrader, Böblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,641

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 82102505

Int. Cl.⁴ G11B *17/32*

U.S. Cl. 360—103 **7 Claims**



1. A magnetic head slider, particularly for magnetic heads flying on an air cushion over a moving magnetic data track, said slider having at least one surface containing a ceramic material including aluminum oxide and titanium carbide, characterized in that said surface is adapted to be adjacent the data track during operation and further characterized in that substantially all of the titanium carbide has been removed substantially to a preselected depth to create a series of isolated pits or recesses in said surface.

4,549,239

HEAD CARRIAGE FOR USE IN A MAGNETIC RECORDING MACHINE

Yoshio Kawajiri, Zama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 19, 1981, Ser. No. 323,029

Claims priority, application Japan, Nov. 19, 1980, 55-161927; Nov. 29, 1980, 55-168179

Int. Cl.⁴ G11B *5/54, 21/22*

U.S. Cl. 360—105 **3 Claims**

1. A head carriage for use in a double-sided recording/reproducing system comprising:

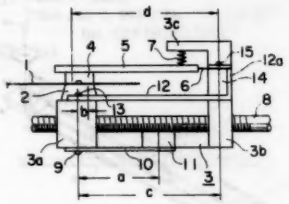
a carriage main body supported to be movable in a reciprocating manner and provided with a forward end and a backward end which are spaced apart over a predetermined distance;

a first magnetic head fixedly mounted on the forward end of said carriage main body;

a second magnetic head disposed opposite to said first magnetic head;

an arm extending substantially in parallel with and as long as said carriage main body and having a free end and a base end, said second magnetic head being fixedly attached to the free end of said arm, said arm being comprised of a first material having a first linear coefficient of expansion;

supporting means having one end fixedly attached to said



forward end of said carriage main body and the other end riding on said backward end of said carriage main body to extend approximately in parallel with said arm and having means for resiliently supporting said arm at the base end thereof, said supporting means being comprised of a second material having a second linear coefficient of expansion which is substantially equal to said first linear coefficient of expansion; and

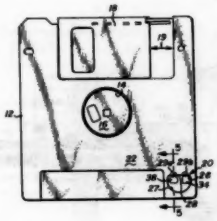
biasing means for biasing said arm in a predetermined direction to bring said second magnetic head opposite to said first magnetic head.

4,549,240

WRITE PROTECTION DEVICE

Brian A. Hodges, Foster City, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Nov. 26, 1982, Ser. No. 444,793
Int. Cl.[4] G11B *23/04, 15/04*
U.S. Cl. 360—133 **10 Claims**



1. A write protection device comprising

a magnetic recording disk cartridge formed by a pair of opposed sides having a write control sensing aperture extending through both sides of the cartridge and including a circular segmental opening in one side of the cartridge,

a shutter mounted within the cartridge for arcuate movement back and forth between positions wherein the aperture is either open or blocked by the shutter, and

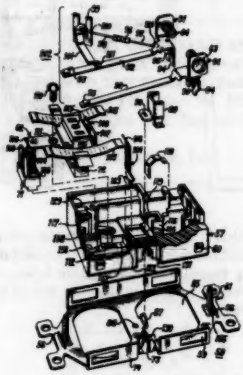
a projection that extends eccentrically from the shutter for cranking the shutter from one position to the other, said projection extending into the circular segmental opening and having surfaces that contact the cartridge for stopping movement of the shutter in the desired positions.

4,549,241

GROUND AND TEST ARRANGEMENT FOR A GROUND FAULT CIRCUIT INTERRUPTER

Robert A. Morris; George W. Kiesel, both of Burlington, and Paul T. Rajotte, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,626
Int. Cl.[4] H02H *3/347*
U.S. Cl. 361—45 **17 Claims**



1. A ground fault circuit interrupter comprising:

a molded plastic case having external projections formed on opposite sides of said case;

a trip solenoid and a signal processor circuit within said case;

an operating mechanism within said case for separating a pair of fixed and moveable contacts in response to said signal processor circuit and said solenoid;

a slotted ground contact stab mounted within a support formed within said case;

a faceplate yoke having a pair of slotted side rails formed integral with and perpendicular to an apertured plate, said side rails being attached to said case by capturing said external case projections within said side rail slots,

a ground stake tab formed integral with and perpendicular to said apertured plate and extending through said contact stab slot to provide electrical and mechanical connection between said yoke and said ground stab; and

a grounding screw tab formed integral with and perpendicular to said apertured plate for providing external ground connection with said yoke.

4,549,242

MOLDED CASE CIRCUIT BREAKER WITH COOLING AND PROTECTION FOR THE STATIC TRIPPING UNIT

Jean-Pierre Nebon, Grenoble; Pierre Barnel, Echirolles; Robert Denis, Grenoble, and Claude Bertrand, Jarrie, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Jun. 7, 1982, Ser. No. 385,871
Claims priority, application France, Jun. 5, 1981, 81 11354
Int. Cl.[4] H02H *7/22*
U.S. Cl. 361—115 **3 Claims**

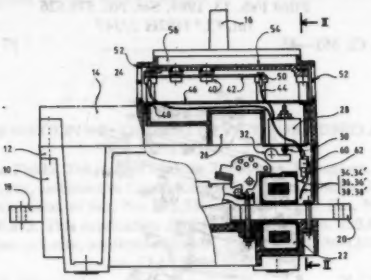
1. Multi-pole circuit breaker having a molded case and a static tripping unit, comprising:

current transformers associated with each pole of the circuit breaker and delivering signals representing the value of the currents flowing through the poles,

an electronic processing device of said signals which delivers a tripping signal in the case of an overload or a short-circuit,

a tripping coil controlled by said tripping signal for tripping said circuit breaker,

a compartment provided in said molded case and sealed off from the rest of the inside of the molded case, ventilation holes provided in said case for communication of said compartment with the outside of the moled case, said electronic processing device being inserted in said com-



partment so that it is protected from the circuit-breaking gases generated inside the case and is cooled down by the air circulating through the ventilation holes, said current transformers being housed in the said rest of the inside of the molded case.

4,549,243

SPRAYING APPARATUS

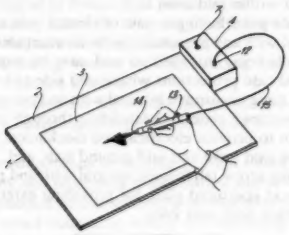
David J. Owen, and Colin G. MacLaine, both of Cleveland, England, assignors to Imperial Chemical Industries, Hertfordshire, England

Filed Mar. 13, 1984, Ser. No. 589,221

Claims priority, application United Kingdom, Mar. 25, 1983, 8308346; May 20, 1983, 8313959; Aug. 18, 1983, 8322308; Oct. 5, 1983, 8326666

Int. Cl.⁴ B05B *5/02*

U.S. Cl. 361—228 **17 Claims**



1. Apparatus for spraying a liquid comprising

(i) freely movable elongated body member, suitable for holding in the human hand, provided with a nozzle at one end,

(ii) means for delivering the liquid to said nozzle,

(iii) a high voltage generator,

(iv) means for applying a sufficiently large electrical potential, relative to earth, from said generator to said nozzle that, when said body member is held in the human hand with the nozzle at a distance of 2 cm above an earthed surface, sufficient electrical gradient is provided at said nozzle to atomise said liquid as a spray of electrically charged droplets,

said nozzle and said means for delivering the liquid thereto being of the type that, when said nozzle is in contact with a surface beneath the nozzle that is receptive to said liquid and is moved relative to, but in contact with, said surface, liquid is transferred from said nozzle onto said surface, but when said nozzle is disposed above, but out of contact with, a surface and no atomising electrical potential is applied to said nozzle, no liquid is dispensed from said nozzle.

4,549,244

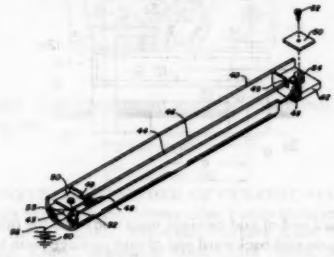
CORONA GENERATING DEVICE

Wilhelmus G. M. Driessen, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1983, Ser. No. 559,586

Int. Cl.⁴ H01T *19/00*

U.S. Cl. 361—229 **8 Claims**



1. A corona generating device comprising a plurality of separate parallel coronode wires supported between insulating end block assemblies, said plurality of parallel coronode wires being spaced less than about 0.2 inches apart relative to the adjacent wire such that when energized each wire is placed within the electrostatic fringe field of the adjacent wire, and means to connect said wires to a coronoa generating potential source.

4,549,245

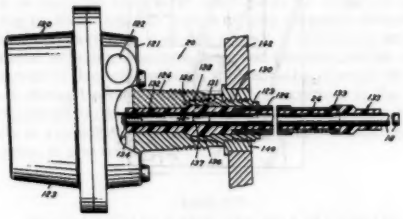
CAPACITANCE-TYPE MATERIAL LEVEL PROBE AND METHOD OF MANUFACTURE

Phillip P. Fleckenstein, Port Huron, Mich., assignor to Berwind Corporation, Philadelphia, Pa.

Division of Ser. No. 419,776, Sep. 20, 1982, Pat. No. 4,499,641. This application Sep. 21, 1984, Ser. No. 652,853

Int. Cl.⁴ H01G *5/28*; G01R *27/26*

U.S. Cl. 361—284 **1 Claim**



1. A capacitance probe for use in material level sensing applications or the like comprising an elongated probe element having a central axis, a tubular guard co-axially surrounding and radially spaced from said probe element, said probe element having a greater axial dimension than said guard and projecting from one end of said guard, one-piece unitarily formed insulation means entirely surrounding said probe element between said guard and said probe element, and surrounding and radially overlapping axially spaced ends of said guard, a portion of said guard intermediate said ends and an end portion of said probe element projecting from said one end of said guard being exposed through said one-piece insulation

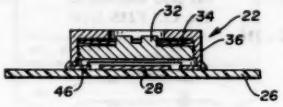
means, and means capturing said insulation means and adapted for mounting said probe to a material vessel with said exposed portions of said guard and probe element being remote from said capturing means for disposition internally of said vessel.

4,549,246

AIR DIELECTRIC VARIABLE CAPACITOR UTILIZING A STATOR FORMED AS PART OF THE CIRCUIT LAYOUT ON THE SUBSTRATE

Robert J. Baumler, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Jul. 2, 1984, Ser. No. 626,671
Int. Cl.[4] H01G 5/06
U.S. Cl. 361—293 **16 Claims**



1. In an air variable capacitor having a conductive housing and a longitudinally adjustable rotor for use in a circuit layout formed on the surface of the substrate of a circuit board, the improvement comprising:

a stator formed as part of the circuit layout and positioned relative to the rotor to develop a capacitance therebetween, the stator being formed on the substrate as part of the circuit layout; and

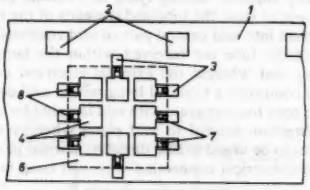
means for electrically contacting the rotor through the conductive housing of the capacitor.

4,549,247

CARRIER ELEMENT FOR IC-MODULES

Joachim Hoppe, and Yahya Haghiri-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,873
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1980, 3043877; Dec. 8, 1980, 3046192
Int. Cl.[4] H05K 1/18
U.S. Cl. 361—398 **9 Claims**



1. An integrated circuit chip carrier element suitable for use in cards providing data to data sensors applied to the card, said carrier element comprising:

an integrated circuit semiconductor chip having a plurality of terminals lying on the exterior of said chip and being generally flush with its surface;

a thin, flexible carrier film having first and second surfaces, said integrated circuit semiconductor chip being positioned proximate to said second surface of said film so that the periphery of the integrated circuit chip defines a corresponding peripheral outline of said chip in said film, said film having a plurality of openings spaced along said outline of said integrated circuit semiconductor chip on said film, at least a portion of each of said openings lying outside said outline; and

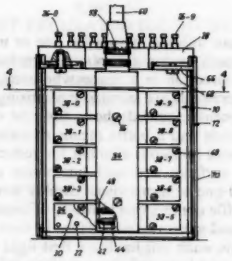
a plurality of leads, each having first and second ends and an intermediate portion between said ends, said first ends being affixed to said first surface of said film and comprising contact elements for receiving the data sensors, said contact elements lying on said first surface substantially within the outline of said integrated circuit semiconductor chip on said film, said intermediate portions of said leads extending through said openings, and said second ends of said leads being connected to said integrated circuit semiconductor chip terminals.

4,549,248

ELECTRO-FLUIDIC CIRCUIT BOARD ASSEMBLY WITH FLUID DUCTS AND ELECTRICAL CONNECTIONS

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,214
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238750
Int. Cl.[4] H05K 7/02
U.S. Cl. 361—400 **7 Claims**



1. An electro-fluidic circuit board assembly comprising:

a plate-like circuit board (**10**) including a plurality of inlet ducts (**32,34**) and a plurality of outlet ducts (**20**) defined therein, said circuit board having at least a part made of rigid foam plastic with a mounting face (**24**) lying in a first plane and containing a first open end (**30,22**) of each of said inlet and outlet ducts, said ducts being adapted to convey a fluid to and from said mounting face;

electrical connector means connected to said circuit board and including a plurality of spring plug connectors (**44**) each structured to permit engagement of a knife contact and for allowing motion of a knife contact toward and away from said mounting face in a direction transverse to said first plane, while maintaining an electrical connection between the knife contact and a spring plug connector;

a plurality of electro-fluidic components (**38**) each having a flat mating surface containing an inlet port and an outlet port, each component connected to said circuit board with its mating surface engaged directly against said mounting surface (**24**) of said circuit board (**10**) so that engagement of said mating surface of each component with said mounting face hermetically seals said ports of each component with respective open ends of said ducts, said first open ends of said inlet and outlet ducts being positioned to engage respectively with inlet and outlet ports of said component, each component having a second surface lying in a second plane transverse to said first plane, a pair of knife contacts (**42**) extending from said second surface of each component and into engagement with one of said spring plug connectors (**44**) whereby each component can move parallel to said second plane toward and away from said mounting face while maintaining contact between its knife contacts and spring plug connectors engaged with its knife contact; and

at least one self-tapping screw (**40**) connecting each component (**38**) to said circuit board.

4,549,249

OVERHEAD LIGHTING SYSTEM FOR ONE OR MORE VISUAL DISPLAY TERMINALS

Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz and Associates, Inc., West Haven, Conn.

Filed Jul. 17, 1984, Ser. No. 631,636
Int. Cl.[4] A61G *13/00*
U.S. Cl. 362—33 14 Claims

1. An overhead lighting system for one or more visual display terminals each having a display screen facing in a single predetermined direction in a space where said one or more visual display terminals are situated comprising,

a luminous element mounted above the one or more visual display terminals and a baffle means mounted at least partially below said luminous element for reducing reflections of overhead surfaces and said luminuous element in the screen of said one or more visual display terminals,

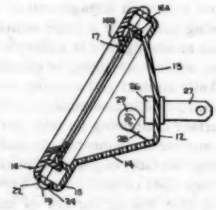
wherein said baffle comprises a plurality of substantially parallel rails disposed generally parallel to the face of each of said display screens, each rail having a first light absorbing surface and a second light reflecting surface, said light absorbing surfaces of said rails being generally disposed facing said screen to reduce reflections from the screen.

4,549,250

NIGHT LIGHT ASSEMBLY

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 30, 1984, Ser. No. 666,386
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—96 9 Claims



1. A night light assembly comprising:

A. a shell supported by an electrical plug projecting from the rear thereof which is insertable in a wall electrical outlet;

B. a socket housed in said shell to receive a low-wattage bulb which is thereby connected to said plug to produce light, said shell having upper and lower vents to permit the flow of air therethrough; and

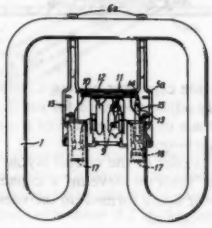
C. a removable frame having a picture slide nested therein covering the shell, the rear face of the slide having a translucent layer thereon in which there is dispersed a volatile aromatic liquid that is embedded in the layer whereby when the slide is illuminated by light from said bulb, heat emanating from the bulb produces a convection current in said shell which passes between said upper and lower vents and flows across the exposed surface of said layer to volatilize the liquid embedded therein and generate an aromatic vapor which is discharged through the upper vent.

4,549,251

DISCHARGE LAMPS

John M. Chapman, Petersfield, and Basil Antonis, London, both of England, assignors to Thorn EMI plc, London, England

Continuation of Ser. No. 342,343, Jan. 25, 1982, Pat. No. 4,458,301. This application Dec. 16, 1983, Ser. No. 561,997
Claims priority, application United Kingdom, Jan. 27, 1981, 8102508; Mar. 31, 1981, 8109947
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.[4] F21S *5/00*
U.S. Cl. 362—216 15 Claims



1. A fluorescent lamp, adapted to co-operate with a lamp holder in the manner of a general lighting service filament lamp, comprising:

a discharge tube internally coated with phosphor and having tube ends and an electrode disposed at each tube end, a lamp support housing fixed to said tube, external electrical connection means carried by said lamp support housing, and internal electrical connection means connecting the external electrical connection means to the tube, wherein:

the discharge tube is disposed substantially in a plane and shaped at least in part to define a substantial part of the boundary of a zone in the plane, the part of the tube defining the boundary including at least one straight portion, the lamp support housing lying in a central part of said zone spaced from the tube and the ends of the tube being re-entrant into said central part of said zone such that the ends of the tube are received within the lamp support housing and wherein the external electrical connection means comprises a terminal lying within said central part of said zone to co-operate with said lampholder and facing in a direction normal to said plane whereby said lamp requires to be urged in said direction normal to said plane to make electrical connection with said lamp holder.

4,549,252

OUTDOOR LIGHTING FIXTURE

John F. Ripley, and Bernice D. Ripley, both of 2 Forecastle Dr., New Port Richey, Fla. 33552

Division of Ser. No. 516,478, Jul. 25, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 665,619
Int. Cl.[4] F21S *5/00*
U.S. Cl. 362—216 4 Claims

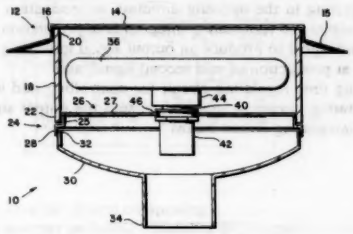
1. An outdoor lighting fixture for a circular fluorescent lamp, comprising:

a base having a generally hemispherical, hollow shape which opens upwardly terminating in a generally circular, horizontal lip, and having a mounting portion at the bottom thereof adapted for attachment to a support;

a retainer plate having a generally circular shape with a downwardly depending skirt disposed about the periph-

ery thereof and adapted to envelop said lip of said base forming a weather resistant joint therewith, said retainer plate further including an upwardly projecting platform having a generally circular periphery and a horizontal upper surface adapted to support a circular fluorescent lamp in a horizontal and substantially coaxial orientation therewith;

a cylindrical shield having a generally circular shape with an upper circular edge and a lower circular edge adapted to envelop said circular periphery of said platform of said retainer plate forming a weather resistant joint therewith, said shield enveloping said circular fluorescent lamp



SEC. 4 - 4'

mounted on said platform of said retainer plate, said cylindrical shield being optically transparent to transmit light generated by said lamp;

a cover with an upper surface having a generally circular shape and a downwardly depending skirt disposed about the periphery thereof adapted to envelop said circular edge of said cylindrical shield forming a weather resistant joint therewith, and including a shade portion projecting outwardly and downwardly from said skirt thereof, for deflecting precipitation and for downwardly reflecting light transmitted by said cylindrical shield;

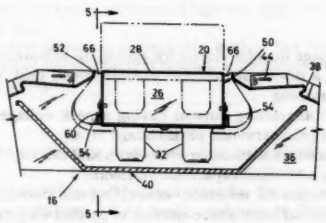
whereby a circular fluorescent lamp can be operated in outdoor adverse weather environments.

4,549,253

LIGHTING FIXTURE

Thomas B. Totten, Stouffville, Canada, assignor to Flexillume Canada Ltd., Markham, Canada

Filed Jul. 18, 1983, Ser. No. 514,942
Int. Cl.[4] F21S *1/06*
U.S. Cl. 362—364 **7 Claims**



1. A telescopic, retractable lighting fixture for use in ceilings for providing an illuminated recess in such a ceiling, and comprising,

an electrical component container having predetermined length, width and height dimensions;

lamp receiving receptacles extending downwardly below such container and together with such height dimension, defining a predetermined minimum storage height;

housing means for defining such a ceiling recess, for mounting in such ceiling, such housing means having side walls and having a lower opening directed downwardly, with such side walls extending upwardly above the plane of such ceiling and defining a predetermined recess depth;

upper opening means defined in an upper portion of said housing means, said upper opening means being shaped to telescopically receive said electrical container therein, said electrical container being telescopically movable within said upper opening means between upper extended and lower retracted position, said upper retracted position providing a shipping and storage function wherein said electrical component housing and electrical receptacles are stored with their storage height contained within the depth dimension of said housing, whereby said lighting fixture has a lower overall height for shipping and storage, and a greater overall height when in use, and,

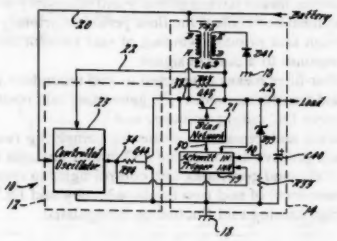
fastening means for fastening said electrical container relative to said housing means, in said upper extended position.

4,549,254

BUCK-BOOST REGULATED D.C. TO D.C. POWER SUPPLY

William R. Kissel, Milford, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 3, 1983, Ser. No. 463,179
Int. Cl.[4] H02P *13/22*
U.S. Cl. 363—21 **15 Claims**



3. A power supply, having an input node and an output node, for supplying DC electrical power to an electronic control system of an engine, which comprises:

a series switching regulator section for regulating the voltage at the output node having a transformer with primary and secondary windings, switching means for switching on and off the flow of current from the input node through the primary winding to the output node, and switching control circuit means for controlling the operation of the switching means in response to the voltage at the output node;

a shunt switching regulator section for boosting the voltage supplied at the input node to produce a desired voltage at the output node when the voltage at the input node is below a predetermined value, the shunt switching regulator section having shunt means for intermittently shunting current through the primary winding towards ground and oscillator circuit means for controlling the operation of the shunt means;

a free-wheeling diode, and wherein

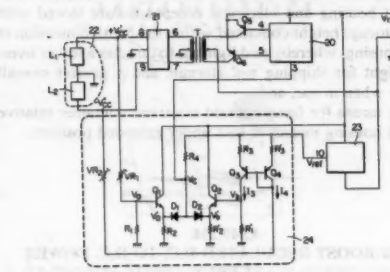
the free-wheeling diode and the secondary winding are connected in series combination between the output node and ground for allowing current to flow through the secondary winding into the output node;

whereby excess energy stored in the transformer on account of current flowing through the primary winding may be beneficially transferred via magnetic coupling and the secondary winding to the output node.

4,549,255
DC-TO-DC CONVERSION CIRCUIT WITH SHARED REGULATION OF OUTPUTS

Mamoru Minamishima, Kodaira, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 554,150
Claims priority, application Japan, Dec. 2, 1982, 57-211660
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—26 **2 Claims**



1. A DC-to-DC conversion circuit for supplying dual positive and negative DC output voltages of the same level in absolute value to a load circuit wherein fluctuations in said positive and negative DC ouput voltages occur alternatively, comprising:

transformer means having primary and secondary windings;

control means to control the flow period of primary current through said primary winding of said transformer means in response to a control signal;

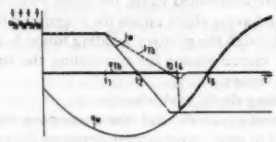
a rectifier-filter means connected to said secondary winding of said transformer means for generating said positive and negative DC output voltages; and

comparing and generating means for comparing two levels of said positive and negative DC output voltages in absolute value and generating said control signal in response to a lower level of said two levels, whereby said DC output voltage causing said fluctuation is regulated.

4,549,256
INVERTER ARCING CONTROL FOR A PARALLEL-RESONANT CIRCUIT STATIC FREQUENCY CHANGER

Hans G. Matthes, Wermelskirchen, and Hasso Wittenbecher, Remscheid, both of Fed. Rep. of Germany, assignors to AEG-Elotherm, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,258
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237716
Int. Cl.⁴ H02P *13/20*; H02M *7/515, 1/18*
U.S. Cl. 363—39 **1 Claim**



1. An inverter circuit comprising:

a bridge circuit formed of thyristors;

a load circuit developed as a parallel oscillating circuit connected to said bridge circuit;

an impulse generating circuit for supplying ignition impulses to said bridge circuit;

first discriminator circuit means for detecting the zero crossover point of the current i_w of the load circuit and producing a first signal;

second discriminator circuit means for detecting the zero crossover point of the voltage u_w of the load circuit and producing a second signal;

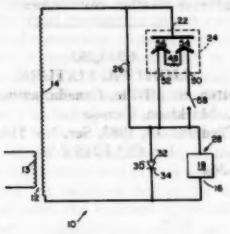
an up-and-down integrating circuit means for integrating in a first direction following production of an ignition pulse, integrating in the opposite direction at production of said first signal and terminating integration at production of said second signal to produce an output signal indicating arcing time at production of said second signal; and

an arcing time regulating circuit for controlling said impulse generating circuit in accordance with the output signal of said integrating circuit means.

4,549,257
VOLTAGE DOUBLER CIRCUIT

Frederick W. MacDougall, Marion, Mass., assignor to Aerovox Incorporated, New Bedford, Mass.

Filed Sep. 16, 1982, Ser. No. 418,782
Int. Cl.⁴ H02M *3/18*
U.S. Cl. 363—61 **6 Claims**



1. A voltage doubler circuit for providing half-wave direct current to a device at different predetermined peak voltage levels, comprising

a source of alternating current having a peak voltage lower than said predetermined peak voltage levels,

a first capacitance element in series with said device,

at least one additional capacitance element,

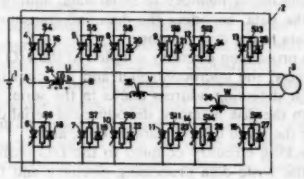
switching means for selectably connecting and disconnecting said additional capacitance element in parallel with said first capacitance element to enable said alternating current source, said first capacitance element, and said additional capacitance element to provide said different predetermined peak voltage levels to said device, and

a resistance element connected between said capacitance elements for causing a direct current voltage buildup on said additional capacitance element when said additional capacitance element is disconnected by said switching means, whereby the peak direct current voltage across said switching means is reduced prior to said additional capacitance element being connected by said switching means.

4,549,258
INVERTER DEVICE USING GATE TURN-OFF THYRISTORS

Mitsuyuki Honbu, Katsuta; Yasuo Matsuda, Hitachi; Katsunori Suzuki, Takahagi, and Yoshiki Kajita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Mar. 3, 1983, Ser. No. 471,704
Claims priority, application Japan, Mar. 3, 1982, 57-32354
Int. Cl.⁴ H02M *7/515*
U.S. Cl. 363—71 **7 Claims**



1. An inverter device comprising:

a unit inverter including a plurality of groups of unit switching circuits connected in parallel with a d.c. power source, each group of unit switching circuits including first and second unit switching circuits and forming one phase of said unit inverter, wherein said first unit switching circuit comprises an upper portion comprised of at least one gate turn-off thyristor and a lower portion comprised of at least one gate turn-off thyristor, said upper and lower portions being coupled directly in series with one another so that the gate turn-off thyristors of said upper and lower portions are in series with one another with a first series node being located between said upper and lower portions of said first unit switcing circuit, and wherein said second unit switching circuit comprises an upper portion comprised of at least one gate turn-off thyristor and a lower portion comprised of at least one gate turn-off thyristor, said upper and lower portions being coupled directly in series with one another so that the gate turn-off thyristors of said upper and lower portions are in series with one another with a second series node being located between said upper and lower portions of said second unit switching circuit;

first current balancing reactors respectively connected between said first and second nodes of the respective groups of unit switching circuits such that said first current balancing reactors are not connected in series between the upper and lower portions of any one unit switching circuit; and

a.c. output terminals respectively leading out from center points of the first current balancing reactors of the respective groups.

4,549,259
GATE CONTROL CIRCUIT FOR CURRENT-TYPE INVERTER APPARATUS

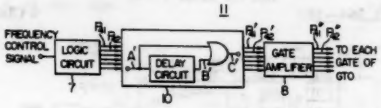
Shigeta Ueda, Hitachi; Mitsuyuki Hombu, Katsuta, and Yasuo Matsuda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,436
Claims priority, application Japan, Jun. 18, 1982, 57-103859
Int. Cl.⁴ H02M *7/515*
U.S. Cl. 363—137 **2 Claims**

1. A gate control circuit for current-type inverter apparatus having an inverter formed of self-extinction devices connected in a bridge form, comprising:

a logic circuit for generating pulse signals to turn on and off said self-extinction devices at a predetermined timing in response to a frequency command signal;

pulse stretcher means for extending the width of said pulse signals of said logic circuit in response to the leading edges of said pulse signals for turning-on said self-extinction devices so as to prevent an operation mode of said inverter wherein said self-extinction devices in a current commutating operation are turned-off simultaneously; and

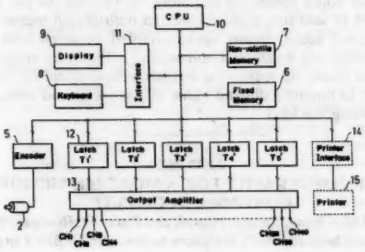


gate amplifiers for amplifying the output signals from said pulse stretcher means and supplying the amplified signals to said self-extinction devices.

4,549,260
CYCLE TIMER

Toshio Saito, Kobe; Kenzo Matsumoto, Hirakata, and Kazuo Soji, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,021
Claims priority, application Japan, Jul. 14, 1981, 56-110297
Int. Cl.⁴ G05B *19/02, 15/02;* **H01H** *43/00*
U.S. Cl. 364—143 **8 Claims**



1. A cycle timer for controlling the ON-OFF periods of the operating cycle of a machine comprising:

encoder means for detecting the angle of rotation of a shaft of the machine and generating angle information indicative of the angular position of the machine shaft detected therefrom;

read-in and read-out memory means for the storage of data descriptive of ON-OFF states of output signals corresponding to the angle information, said memory means storing data descriptive of the ON-OFF states of a plurality of output signals including one or a plurality of ON regions for each output signal, the output signals corresponding to respective angle information to be read out in parallel output channels;

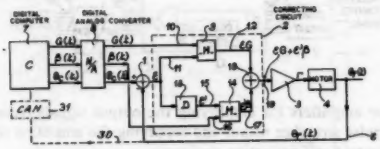
program means for writing the data in the memory means in correspondence with an arbitrary angular position of the machine shaft; and

output means for simultaneously reading out the data from the memory means for each of said parallel output channels in response to a given angular position of said machine shaft detected by said encoder means to turn on and off output signals from the timer, to control said ON-OFF periods.

4,549,261
HYBRID ANALOG CONTROL STRUCTURE

Mayez Al Mouhamed, Talkalakh, Syria, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 26, 1983, Ser. No. 460,996
Claims priority, application France, Jan. 27, 1982, 82 01235
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—183 **4 Claims**



1. A control system having a loop for control of the shaft angular position θ_r of a motor driving a load, wherein the load inertia J referred to the rotational axis of the motor is variable, said system energizing said motor to produce a torque in response to an error ϵ equal to the difference between a commanded angular position θ_c and the real angular position θ_r of said motor shaft, said system comprising:

a computer providing values of a loop gain G and a loop damping β;

a transducer sensing the motor shaft position θ_r

first adder means for combining the commanded position θ_c and the real position θ_r to form the error ϵ;

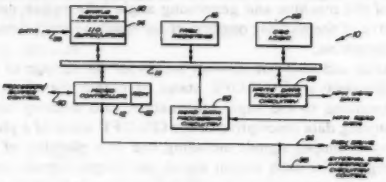
a first and a second multiplying means coupled between said computer and said first adder means for forming the products, respectively, $G\epsilon$ and $\beta\epsilon'$, said second multiplying means including derivative means for differentiating ϵ to provide its derivative ϵ'; and

second adder means for summing the $G\epsilon$ and the $\beta\epsilon'$ products of said first and said second multiplying means, said second adder means being coupled between said first multiplying means and said second multiplying means and said motor for ouputting a signal proportional to $G\epsilon$ and $\beta\epsilon'$ to impart a desired value of torque to said motor for driving the load.

4,549,262
CHIP TOPOGRAPHY FOR A MOS DISK MEMORY CONTROLLER CIRCUIT

Randall M. Chung, Laguna Niguel, and Larry D. Rossean, Westminster, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 20, 1983, Ser. No. 505,754
Int. Cl.[4] G06F *3/00, 13/00*; H01L *27/06*
U.S. Cl. 364—200 **16 Claims**



1. A metal oxide semiconductor (MOS) chip for a disk memory controller circuit (DMC) for use in conjunction with external circuitry including an external processor and a buffer memory, said DMC for transferring data between an external disk memory having a disk, and the processor or the buffer memory, said DMC comprising:

(a) chip interface circuitry adapted to couple the DMC to signal lines of external circuitry;

(b) input/output (I/O) buffer/latch circuitry coupled to the chip interface circuitry for buffering and latching data transmitted between the DMC and the processor or buffer memory;

(c) a microcontroller for regulating the functions of the DMC;

(d) task registers coupled to the microcontroller and the buffer/latch circuitry for storing control information received from the processor;

(e) a read-only-memory (ROM) coupled to the microcontroller, for storing program instructions used by the microcontroller;

(f) write data processing circuitry coupled to the I/O buffer/-latch circuits, the microcontroller and the chip interface circuit, for converting parallel data received from the processor or the buffer memory to serial data, adding address marks to the data, encoding the data and transmitting the encoded data to the disk memory;

(g) read data processing circuitry coupled to the I/O buffer/-latch circuitry, the microcontroller and the chip interface circuitry for detecting address marks in the serial data received from the disk memory, decoding the serial data and converting the serial data to parallel data; and

(h) error checking circuitry coupled to the I/O buffer/latch circuitry, the write data processing circuitry and the read data processing circuitry for detecting transmission errors in the data read from the disk memory;

wherein the chip interface circuitry forms a quadrilateral outer framework on the chip; the ROM is disposed within one corner of the interface circuitry; the microcontroller is disposed adjacent to the ROM and along part of a first side of the interface circuitry; the read data processing circuitry is disposed adjacent to the microcontroller and within a second corner of the interface circuitry and along part of a second side thereof; the error checking circuitry is disposed adjacent to the read data processing circuitry and along part of the second side of the interface circuitry; the microcontroller is also disposed adjacent to the error checking circuitry and along part of the second side of the interface circuitry; the write data processing circuitry is disposed adjacent to the microcontroller along the second side of the interface circuitry, and is disposed within a third corner of the interface circuit and along a part of a third side of the interface circuitry; the microcontroller is also disposed adjacent to the write data processing circuitry along the third side of the interface circuitry; the I/O buffer/latch circuitry is disposed adjacent to the microcontroller along the third side of the interface circuitry, and is disposed within a fourth corner and along a part of a fourth side of the interface circuitry; the microcontroller is also disposed adjacent to and between the I/O buffer latch circuitry and the ROM along the fourth side of the interface circuitry; and the task registers are disposed between the microcontroller and the I/O buffer/latch circuitry.

4,549,263
DEVICE INTERFACE CONTROLLER FOR INPUT/OUTPUT CONTROLLER

Powell L. Calder, Georgetown, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 466,389, Feb. 14, 1983, abandoned, which is a continuation of Ser. No. 92,293, Nov. 8, 1979, abandoned. This application Dec. 7, 1984, Ser. No. 679,610
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **7 Claims**

1. A device interface controller for input/output communication between a central processor and a plurality of input and output peripheral digital apparatus, comprising:

(a) a write command file for queuing commands from the central processor;

(b) device write control means connected to receive and store data from the central processor to be output to the plurality of output peripheral digital apparatus, for controlling and transmitting data to the output peripheral digital apparatus;

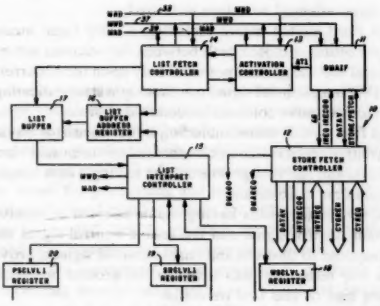
(c) write sequence control means connected to receive and

store commands from the central processor through said write command file, for providing selection and control signals for the output peripheral digital apparatus in response thereto, to cause the output peripheral digital apparatus to operate on the data supplied by the device write control means;

(d) data read control means, connected to receive and store data from the plurality of input peripheral digital apparatus to be input to the central processor, for controlling and transmitting data to the central processor;

(e) system read control means, connected to receive and store commands from the central processor, for providing selection and control signals for the input peripheral digital apparatus in response thereto, to cause the input peripheral digital apparatus to read data into the data read control means, selectively concurrently with the operation of the output peripheral digital apparatus; and

(f) selector means, connected to the plurality of input and output peripheral digital apparatus and responsive to the selection signals from the write sequence control means and system read control means for selecting an output peripheral digital apparatus and an input peripheral digital apparatus, respectively, in response thereto;



said write sequence control means comprises:

a write sequence microprocessor for receiving the commands from the write command file and providing the selection and control signals in conformance with the commands to the output peripheral digital apparatus;

a write sequence read-only memory for controlling the write sequence microprocessor;

a left interface vector bus, connected to the write sequence microprocessor for transmitting the commands thereto; and

a right interface vector bus, connected to the write sequence microprocessor, for transmitting the selection and control signals to the output peripheral digital apparatus;

said device write control means comprises:

a shift register, responsive to signals from the write sequence microprocessor for providing control signals to control the flow of data to the output peripheral digital apparatus; and

first-in, first-out register means, connected to receive data from the central processor and to receive the control signals from the shift register, for queuing data to be transmitted to the selected output peripheral digital apparatus.

4,549,264

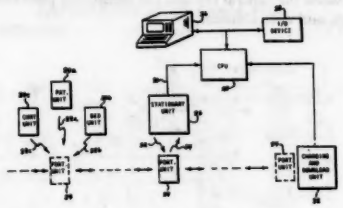
TIME AND ACCOUNTING SYSTEM

Gary T. Carroll, Boulder County, and Robert D. Hunter, Asanahoe County, both of Colo., assignors to B.I. Incorporated, Boulder, Colo.

Filed Oct. 4, 1983, Ser. No. 539,049

Int. Cl.[4] G01J *1/00*

U.S. Cl. 364—406 **22 Claims**



1. A system for recording the interaction between a plurality of objects, at least one of which objects moves relative to the other objects, said system comprising:

a transmitting unit, said transmitting unit including: means for generating a uniquely coded radio frequency (RF) signal, means for transmitting said uniquely coded RF signal at prescribed intervals, and first attachment means for attaching the transmitting unit to a selected one of said plurality of objects; whereby said uniquely coded RF signal thereafter identifies said selected object; and

a receiving unit, said receiving unit including: means for receiving said uniquely coded RF signal only when said transmitting unit and said receiving unit remain within a specified distance of each other for a specified time, second attachment means for attaching the receiving unit to another of said plurality of objects, and recording and timing means within said receiving unit for recording the receipt of the uniquely coded RF signal, including the time and interval during which the uniquely coded RF signal was received; whereby the recording and timing means within the receiving unit may be subsequently examined to indicate the time at which the receiving unit came within the specified distance of a particular transmitting unit and the duration of time during which said specified distance was maintained, thereby providing an indication of the interaction between the selected objects.

4,549,265

METHOD OF AND DEVICE FOR IMAGE RECONSTRUCTION IN COMPUTED TOMOGRAPHY

Willem H. M. Deckers, and Johannes C. A. Op de Beek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,936

Claims priority, application Netherlands, Oct. 22, 1982, 8204086

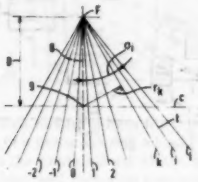
Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—414 **7 Claims**

1. In a method for determining a radiation attenuation distribution in a body section by the methods of computed tomography which comprises: irradiating the body section from a plurality of source positions which are disposed around the body section with a flat, fan-shaped beam of penetrating radiation, said beam diverging from each source position and having a central ray which passes through a central point situated within the body section; for each of said source positions, measuring a data group of data elements, each data element being respectively a measure of the radiation attenuation along an associated measuring path which is situated in the beam on a line which connects the source position to an associated one of a plurality of detector positions which are distributed on the

opposite side of the body from the source position; mathematically combining each data group, either (a) by convolution with a group of convolution numbers or (b) by Fourier transformation, filtering, and back-transformation; and back-projecting the data thus combined into elements of a matrix of pixels, the improvement comprising the steps of:

prior to said combining step, pre-conditioning the data by multiplying each data element by a pre-conditioning factor which is a function of the cosine of the angle enclosed between the central ray and the measuring path associated with said data element;



then combining the pre-conditioned data elements by either convolution or by Fourier transformation, filtering and back-transformation as if the pre-conditioned data elements had been measured along parallel measuring paths;

then post-conditioning the data by multiplying each combined data element by a post-conditioning factor which is inversely proportional to the variation of the angle enclosed between the central ray and the associated measuring path and which is proportional to the square of the cosine of said angle; and

then back-projecting each of said post-conditioned data elements along the same measuring path on which the corresponding original data element was measured.

4,549,266

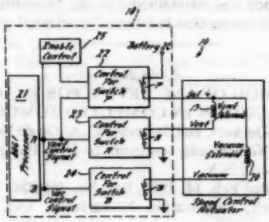
VEHICLE SPEED CONTROL

Jack H. Schneider, Taylor, and Gary D. Huber, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 25, 1983, Ser. No. 555,263

Int. Cl.[4] B60K *31/00*

U.S. Cl. 364—426 **2 Claims**



1. An apparatus for controlling a vent valve solenoid and a vacuum valve solenoid actuating an automobile throttle by the application of a pressure vent and a vacuum source to an actuator chamber of an automotive speed control device, said automotive speed control device including means generating a vent control signal having a first logic state indicating desired energization of the vent solenoid and a second logic state indicating a desired off condition of the vent solenoid, generating a vacuum control signal having a first logic state indicating desired energization of the vacuum solenoid and a second logic state indicating a desired off condition of the vacuum solenoid, and generating an enable control signal having a first logic state indicating desired activation of the speed control device and a second logic state indicating a desired nonactivation of the speed control device, said apparatus including:

a first switch means coupled between a voltage source and a common node of a first terminal of the vent valve solenoid and a first terminal of the vacuum valve solenoid for selectively applying voltage to both the vacuum valve solenoid and the vent valve solenoid;

a second switch means coupled between a second terminal of the vent valve solenoid and a ground potential;

a third switch means coupled between a second terminal of the vacuum valve solenoid and a ground potential;

said first switch means including a first logic means for permitting a closed path between the voltage source and the vent and vacuum solenoids only upon the simultaneous occurrence of the three conditions of: (1) an indication by the vent control signal of a desired actuation of the vent valve solenoid, thereby closing the vent valve and establishing a vacuum in the actuator chamber upon activation of the vacuum valve solenoid, (2) an indication by the enable control signal of a desired activation of the speed control device and (3) determination that current flow between said common node and said first switch means is below a desired magnitude;

said second switch means including a second logic means for permitting a closed path between the vent valve solenoid and the ground potential only upon the occurrence of a vent control signal in a first logic state indicating that vent valve solenoid actuation is desired;

said third switch means including a third logic means for permitting a closed path between the vacuum valve solenoid and the ground potential only upon the occurrence of a vacuum control signal in a first logic state indicating that vacuum valve solenoid actuation is desired;

said first switch means including a first transistor having an emitter collector circuit connected between said common node and the voltage source, and having a base coupled to said first logic means;

said first logic means having inputs adapted to receive the vent control signal and the enable control signal and, in response to the vent and enable control signals, providing a low resistance path between the ground potential and the base of said first transistor;

said first logic means including a current detection means for sensing the current at the common node and applying a voltage to the base of said first transistor; and

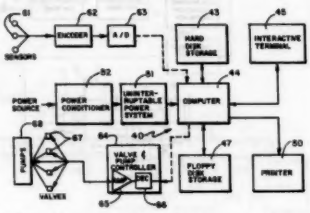
said first logic means including a second transistor means having an emitter collector circuit coupled between the base of said first transistor means and the voltage source, a pair of opposing diodes coupled between the base of said second transistor means and an electrical node for receiving a signal which is a function of the vent and enable control signals, a capacitor coupled between a node between said opposing diodes and the emitter of said second transistor means, a third transistor means having collector means coupled to said opposing diodes and a base means to receive a function of the enable control signal, a first resistor coupled between the emitter of said second transistor means and said collector means of said third transistor means, a second resistor coupled between the collector of said second transistor means and the collector means of said third transistor means, a third resistor coupled between the base of said second transistor means and the emitter of said first transistor means, a fourth resistor coupled between the emitter of said first transistor means and the voltage source, and a fourth transistor means having collector means coupled to the emitter of said third transistor means, emitter means coupled to the ground potential and base means to receive a function of the vent control signal.

4,549,267

MOMENT STABILITY SYSTEM FOR LARGE VESSELS

Stephen J. Drabouski, Jr., 6384 S. Eaton Ct., Littleton, Colo. 80123

Filed Jun. 10, 1983, Ser. No. 503,185
Int. Cl.[4] G06F *15/20;* B63B *43/04*
U.S. Cl. 364—463 26 Claims



1. A moment stability system for maintaining proper stability for a large vessel after sustaining damage or abnormal conditions wherein the system includes in combination:

(a) a data input means which establishes a data base for the storage and retention of required information concerning the vessel for performing and maintaining the system;

(b) an operational stability means for utilizing the information in the data base to establish the normal operational stability parameters for the oceangoing vessel;

(c) a stability assessment means capable of receiving data concerning damage sustained by said vessel and determining the post-damage stability status of said vessel; and

(d) a corrective strategy means which will compare the parameters of the operational stability status and the post-damage stability status and produce a suggested corrective action strategy which will return the vessel to a suitable stability status to provide a safe operating condition.

12. A method of performing stability analysis and damage control onboard a large vessel, including the steps of:

(a) obtaining necessary data for the compartments, tanks and cargo location of said vessel;

(b) inputting said data into a data storage base whereby the data can be quickly retrieved as necessary;

(c) determining the normal operational stability of the vessel by use of the obtained data to determine the original stability parameters for the vessel;

(d) inputting updated data concerning the applicable compartments, tanks and cargo when a damaging force is sustained by said vessel;

(e) determining revised stability parameters for said vessel in said post-damaged condition;

(f) comparing the original stability parameters with the post-damage stability parameters and determining whether the revised parameters are within a predetermined safe range for the vessel; and

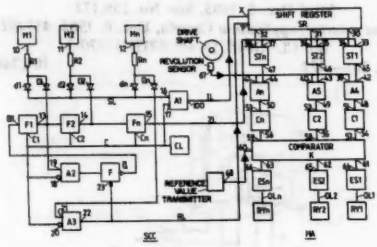
(g) establishing a corrective action strategy for improving the post-damage stability status of the vessel, if the parameters are outside the safe range, for returning the vessel to a safe and stable operational condition.

4,549,268

APPARATUS FOR MEASURING THE LENGTH OF FILAMENTARY MATERIAL, SUCH AS YARN OR THREAD WOUND-UP AT INDIVIDUAL WINDING OR SPINNING LOCATIONS OF A TEXTILE MACHINE

Hansruedi Stutz, Dietlikon, Switzerland, assignor to Loepfe Brothers Limited, Wetzikon, Switzerland

Filed Aug. 5, 1983, Ser. No. 520,700
Claims priority, application Switzerland, Aug. 18, 1982, 4934/82
Int. Cl.[4] G06F *15/46;* G06M *3/02*
U.S. Cl. 364—470 5 Claims



1. An apparatus for measuring the length of filamentary material, such as yarn or thread, wound-up at a number n of individual locations, especially at winding or spinning locations, in a textile machine including a drive shaft common to all said locations, said apparatus being capable of cooperating with an electronic scanner operating in scanning cycles and including a first output line for a thread running signal, a second output line for a reset signal and a third output line for a read-in signal for each one of said number n of said locations, said reset signal and said read-in signal being supplied at the end of each of said scanning cycles, comprising:

a shift register including a number n of parallel outputs and two inputs, one of said two inputs being connected to said first output line conducting said thread running signal and the other one of said two inputs being connected to said second output line conducting said reset signal;

a number n of storage members each having two inputs and an output, a first one of said two inputs being connected to said third output line conducting said read-in signal and a second one of said two inputs being connected to a respective one of said number n of parallel outputs of said shift register;

a revolution sensor having an output and generating at said output a signal indicative of one revolution of said common drive shaft;

a number n of AND-gates each having two inputs and an output, a first one of said two inputs being connected to said output of said revolution sensor and a second one of said two inputs being connected to said output of a respective one of said number n of said storage members;

a number n of electronic counters each having an input and an output, said input being connected to said output of a respective one of said number n of said AND-gates;

a reference value transmitter having an output and generating at said output a signal indicative of a reference value of a predetermined number of revolutions of said common drive shaft;

a comparator having a number n of measuring inputs, a number n of outputs and a reference signal input connected to said output of said reference value transmitter, each of said number n of measuring inputs being connected to said output of a respective one of said number n of counters;

a number n of electronic switches each having an input and an output, each said input being connected to a respective one of said number n of said outputs of said comparator;

a number n of relays each having an input, said input being connected to said output of a respective one of said electronic switches; and

each of said relays being activated by said ! comparator via each said respective electronic switch connected thereto.

4,549,269

METHODS AND APPARATUS FOR MAKING PREVAILING TORQUE NUTS

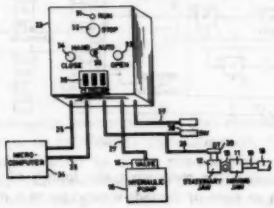
Raymond L. LaPointe, Hamilton, and John D. Olmsted, Ancaster, both of Canada, assignors to Stelco, Inc., Ontario, Canada

Filed Dec. 5, 1983, Ser. No. 558,173

Claims priority, application Canada, Dec. 8, 1982, 417282

Int. Cl.⁴ G06F *15/46;* **B21D** *53/20*

U.S. Cl. 364—472 **10 Claims**



1. A method for imparting a prevailing torque to a nut comprising the steps of:

(a) placing said nut between two relatively movable jaws,

(b) decreasing the gap between said jaws at substantially constant velocity until said jaws contact said nut,

(c) measuring the relative deceleration of said jaws to determine the point in time at which said jaws contact said nut at the onset of deceleration,

(d) determining the relative displacement of said jaws at substantially said point in time,

(e) determining a target displacement by deducting from the displacement value determined in step (d) a predetermined displacement,

(f) continuing to decrease the gap between said jaws while monitoring the spacing between said jaws,

(g) determining when said target displacement is reached, and

(h) when said target displacement referred to in step (g) is reached, signalling said jaws to stop closing movement and subsequently to open.

4,549,270

METHOD OF CONTROLLING SELECTION OF TOOLS IN A QUADRIAXIAL NUMERICAL CONTROL LATHE

Naoe Fukumura; Shunji Hasegawa, both of Nagoya, and Masanobu Tanaka, Iwakura, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Niwa, Japan

Filed Mar. 4, 1983, Ser. No. 472,253

Claims priority, application Japan, Mar. 11, 1982, 57-39212

Int. Cl.⁴ G05B *19/00;* **G06F** *11/00*

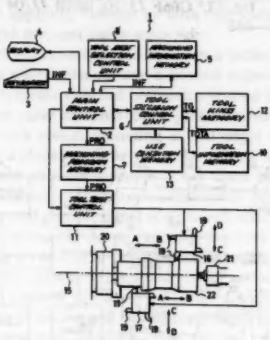
U.S. Cl. 364—474 **16 Claims**

1. A method of controlling selection of tools in a quadriaxial numerical control lathe provided with two tool rests each mounting a plurality of tools and adapted to perform machining by the use of said tool rests, comprising the steps of:

storing in a tool kind memory a tool kind table including kinds of tools and corresponding machined portions and machining modes, and storing in a tool information memory tool data including kinds of tools mounted on said tool rests, the positions of said tools on said tool rests, and identification of said tool rests;

retrieving the content of said tool kind table in response to a determined machining mode and said machined portions for each machining process in order to determine the kinds of tools used in each machining process;

retrieving said tool data from said tool information memory in response to the kinds of the tools thus determined; and



selecting and extracting the tools usable in each machining process based on the retrieved tool data.

4,549,271

MEASUREMENT METHOD BY NUMERICAL CONTROL DEVICE

Ryoichiro Nozawa, Tokyo; Nobuyuki Kiya, Hachioji, and Akio Ichimura, Hino, all of Japan, assignors to Fanuc Limited, Minamitsuru, Japan

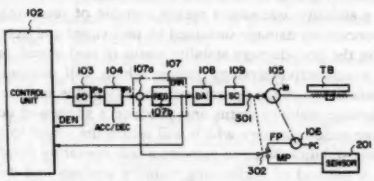
PCT No. PCT/JP82/00200, § 371 Date Jan. 27, 1983, § 102(e) Date Jan. 27, 1983, PCT Pub. No. WO82/04312, PCT Pub. Date Dec. 9, 1982

PCT Filed May 27, 1982, Ser. No. 464,495

Claims priority, application Japan, May 29, 1981, 56-082895

Int. Cl.⁴ G01B *21/00;* **G05B** *19/42*

U.S. Cl. 364—474 **3 Claims**



1. A measurement method performed by a numerical control device having difference means for counting, computing and storing the difference between a number of sensor pulses each of which is generated by a sensor whenever a movable element moves by a predetermined amount, and a number of command pulses generated by a pulse distributor, a motor being controlled in such a manner that said difference approaches zero, comprising the steps of:

(1) counting the sensor pulses generated by the sensor;

(2) applying the counted values to the pulse distributor as a command;

(3) computing, by said difference means, the difference between the number of command pulses generated by the pulse distributor and the number of sensor pulses;

(4) applying said difference to the pulse distributor as a command after the generation of the number of command pulses equivalent to said counted value;

(5) executing a pulse distribution operation to said motor based on said difference and repeating steps (3) and (4); and

(6) computing the total sum of said difference, the total sum of said difference serving as the total number of generated sensor pulses.

4,549,272

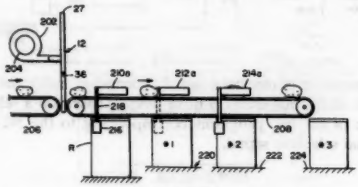
APPARATUS FOR FILLING CONTAINERS WITH PRESCRIBED QUANTITY OF PRODUCT BY WEIGHT

James C. Hagan, and Owen C. Hagan, both of Stockton, Calif., assignors to Hagan Engineering, Inc., Stockton, Calif.

Division of Ser. No. 395,804, Jul. 6, 1982, Pat. No. 4,490,801. This application Oct. 24, 1984, Ser. No. 664,315

Int. Cl.⁴ G01N *9/02*

U.S. Cl. 364—478 **3 Claims**



1. Container filling apparatus for filling each of a plurality of containers with a substantially uniform predetermined weight of articles comprising an article inlet conveyor and an article outlet conveyor in article receiving relation to said article inlet conveyor, means intermediate said conveyors for determining the weight each article transported from said inlet conveyor to said outlet conveyor, first diverting means downstream of said weight determining means for controllably diverting articles traversing said outlet conveyor to a first container disposed adjacent said outlet conveyor, second diverting means downstream of said first diverting means for controllably diverting articles from said outlet conveyor to a second container, a third container downstream of said second diverting means for receiving all articles not diverted from said outlet conveyor by said first and second diverting means, and controlling means coupled to said weight determining means and responsive to the weight determined thereby for controlling said first and second diverting means, said controlling means including means for individually accumulating the weight of articles loaded into each of said containers, means for computing the sum of the weight from said weight determining means and the accumulated weight from a selected one of said accumulating means, and means responsive to said computing means for activating an appropriate one of said diverting means to divert the article from the container associated with the selected accumulated weight when the sum exceeds the predetermined weight and to admit the article to the container associated with the selected accumulated weight when the sum is less than or equal to the predetermined weight.

4,549,273

MEMORY ACCESS CONTROL CIRCUIT

Kam B. Tin, Burnaby, Canada, assignor to AEL Microtel Limited, Calif.

Filed Dec. 10, 1982, Ser. No. 448,448

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—200 **6 Claims**

1. A memory access control circuit used in a computer system including a memory and a host processor and a remote processor, each of said processors operative to provide a memory access request, said memory access control circuit comprising:

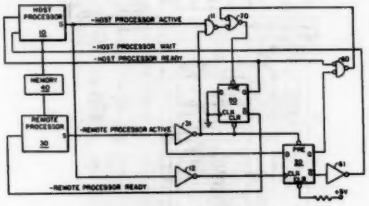
first storage means connected to said host processor and remote processor and operative in response to an absence of said remote processor memory access request to provide a host processor ready signal;

further operative in response to said remote processor memory access request and an absence of said host processor memory access request to provide a remote processor ready signal;

further operative in response to said host processor memory access request and a subsequent remote processor memory access request to provide said host processor ready signal;

further operative in response to said remote processor memory access request and a subsequent host processor memory access request to provide said remote processor ready signal; and

second storage means connected to said first storage means and said host and remote processors, and operative in



response to said remote processor memory access request and said subsequent host processor memory access request to provide a host processor wait signal;

said first storage means further operative in response to simultaneous occurrence of said host and remote processor memory access requests to provide said remote processor ready signal;

said second storage means further operative in response to said simultaneous occurrence of said host and remote processor memory access requests to provide said host processor wait signal.

4,549,274

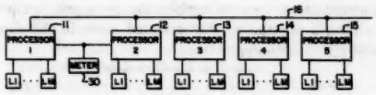
DISTRIBUTED ELECTRIC POWER DEMAND CONTROL

Edward M. Lerner, Naperville, and Harold J. Olson, Hawthorn Woods, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 11, 1983, Ser. No. 512,519

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—492 **13 Claims**



1. A distributed load processing system for shedding and/or adding loads controlled by a plurality of processors for maintaining power demand by said loads below user established limits comprising:

a common communication channel;

a plurality of processors connected to said common communication channel;

means for sensing the power consumption of said loads and for transmitting said power consumption to said plurality of processors; and,

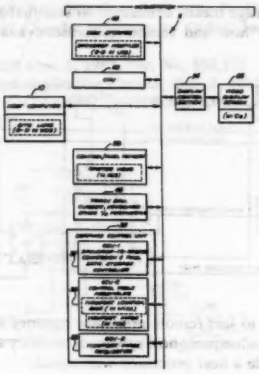
each of said processors having demand limit means for establishing a demand limit representing a desired power demand limit, means for comparing the demand limit to said power consumption, and means for determining when a processor should shed and/or add its associated loads to maintain said power consumption below said demand limit.

4,549,275

GRAPHICS DATA HANDLING SYSTEM FOR CAD WORKSTATION

Josef Sukonick, Cupertino, Calif., assignor to Cadtrak Corporation, Sunnyvale, Calif.

Filed Jul. 1, 1983, Ser. No. 510,343
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—521 9 Claims



1. In a video graphics display station, the improvement comprising:

memory means for storing a backdrop viewfile comprising a two dimensional representation in vector format of a selected view of a complex three dimensional structure,

toroidal strip writing means for transforming strips of said vector format representation into pixel bit map data format comprising a sequence of raster views representing contiguous regions of said selected view, and

panning display means for producing from said raster views a video display which pans across said selected view,

said toroidal strip writing means including means for detecting when said display approaches an edge of the region represented by the current raster view and for thereupon causing transformation of a new strip of said vector format representation, said new strip representing the contiguous region of said selected view in the direction of panning but the newly transformed bit map data being entered into the current raster view to replace therein a prior strip representing a portion of said selected view in the direction away from panning travel.

4,549,276

INDUSTRIAL ROBOT CONTROL METHOD

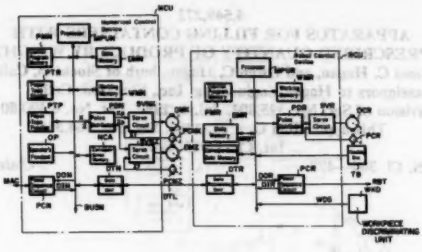
Hajimu Inaba, Hino, and Shinsuke Sakakibara, Komae, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00305, § 371 Date Mar. 25, 1983, § 102(e) Date Mar. 25, 1983, PCT Pub. No. WO83/00573, PCT Pub. Date Feb. 17, 1983
PCT Filed Aug. 4, 1982, Ser. No. 491,426
Claims priority, application Japan, Aug. 4, 1981, 56-122016
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Int. Cl.[4] G06F 15/46; G05B 19/42
U.S. Cl. 364—513 10 Claims

1. An industrial robot control method for use in a system having a machine tool, a numerical control device for controlling the machine tool under one of a plurality of NC programs, an industrial robot and a robot control device for controlling the industrial robot, comprising the steps of:

(a) storing the plurality of NC programs in the numerical control device;

(b) automatically generating an NC program selection signal under the control of the robot control device; and



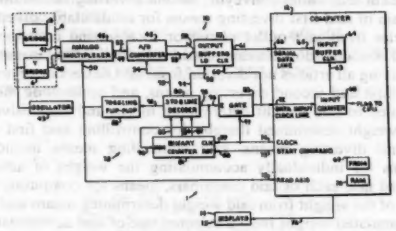
(c) executing numerical control processing, under the control of the numerical control device, based on a selected one of the NC programs corresponding to the NC program selection signal.

4,549,277

MULTIPLE SENSOR INCLINATION MEASURING SYSTEM

Amber N. Brunson; Deighton E. Brunson, both of Independence, and Walter W. Ray, Jr., Kansas City, all of Mo., assignors to Brunson Instrument Company, Kansas City, Mo.

Continuation-in-part of Ser. No. 381,546, May 24, 1982, Pat. No. 4,486,844. This application Sep. 6, 1983, Ser. No. 529,336
Int. Cl.[4] G01C 9/06
U.S. Cl. 364—559 24 Claims



1. A method of determining the inclinations of a plurality of surfaces comprising the steps of:

(a) placing a plurality of inclination sensors on a plurality of respective surfaces, each sensor varying an electrical parameter in proportion to the degree of inclination of said sensor;

(b) generating a respective electrical signal in cooperation with each sensor, each signal having a signal property which varies in proportion to the variation in said electrical parameter, whereby said signal property varies in proportion to the inclination of the associated sensor from a reference inclination;

(c) simultaneously converting each electrical signal to a digital word representative of the variation of said signal property from a reference value thereof, the binary value of said digital word being representative of the inclination of the sensor associated with said signal;

(d) storing each digital word in a support memory of a respective support unit;

(e) selectively transmitting each word to a main processor including a main memory and a display means;

(f) translating each digital word transmitted to said main processor to an angle reading substantially equal to the inclination of the associated sensor; and

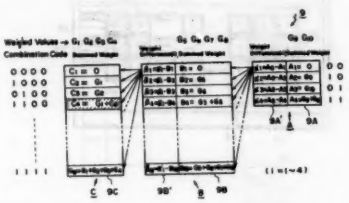
(g) selectively displaying the angle readings on said display means.

4,549,278

COMBINATORIAL WEIGHING METHOD AND APPARATUS

Kazukiyo Minamida, and Setsuo Haze, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Feb. 24, 1982, Ser. No. 351,959
Claims priority, application Japan, Feb. 25, 1981, 56-27204
Int. Cl.[4] G01G *19/04, 23/22*
U.S. Cl. 364—567 **15 Claims**



13. A combinatorial weighing method for weighing articles divided into numbered groups and for providing a total weight closest to a target weight, said method comprising:

(a) computing the combination sums in each numbered group for all combinations of weighted values including one combination in each numbered group where no weighed values are combined resulting in a zero value combination sum;

(b) subtracting the combination sums of the highest numbered group from the target weight resulting in highest group differences;

(c) subtracting the combination sums of the next lowest numbered group from each of the highest differences resulting in next highest group differences until all numbered groups have been subtracted;

(d) comparing the next highest group differences and the highest group differences and selecting the smallest difference as the combination of weighed values closest to the target weight; and

(e) discharging the combination of weighed articles.

14. A combinatorial weighing method for weighed articles divided into numbered groups and for providing a total weight closest to a target weight, said method comprising:

(a) computing the combination sums in each numbered group for all combinations of weighed values including one combination sum in each numbered group where no weighed values are combined resulting in a zero value combination sum;

(b) subtracting combination sums of the highest numbered group from the target weight resulting in highest group differences;

(c) determining whether each highest group difference is within a predetermined range;

(d) comparing each highest group difference with a prior difference and substituting the smaller as the prior difference if the difference is within the predetermined range;

(e) subtracting the combination sums of the next lowest numbered group from each highest group difference which is outside the predetermined range resulting in a next highest group difference;

(f) comparing each next highest group difference with the prior difference and substituting the smaller as the prior difference if the differences are within the predetermined range; and

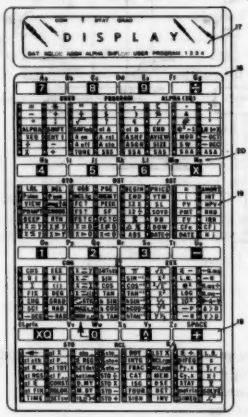
(g) discharging the combination of weighed articles corresponding to the prior difference.

4,549,279

SINGLE HAND, SINGLE FINGER STROKE ALPHAMERIC DATA PROCESSING KEYBOARD SYSTEM

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 459,998, Jan. 21, 1983,. This application Apr. 26, 1983, Ser. No. 488,692
Int. Cl.[4] G06F *3/02;* **H01H** *13/70*
U.S. Cl. 364—709 **7 Claims**



1. A manual entry data processing system, comprising in combination,

a manually actuated keyboard arrangement with a plurality of individual manually movable keyswitches arranged in a single field side-by-side for access by a single hand and for selective actuation by the stroke of a single finger engaging selectively either individual keyswitches or sets of at least two concurrently actuated side-by-side keyswitches bridged by the finger,

selection means responsive to the keyswitches actuated for each single finger stroke to derive a set of unique signals numbering substantially in excess of the number of keys,

data processing means responsive to said unique signals to enter data words therefrom for processing and to select operating modes from the unique signals for processing the entered data, said data processing means being capable of processing such entered data in a plurality of different modes including a plurality of arithmetic operations,

a live keyboard data entry operating mode provided by said data processing means providing for the serial entry of multiple digit words one digit at a time in response to a plurality of successive single finger strokes producing corresponding ones of said unique signals and terminated by a further single finger stroke at a designated keyswitch on the keyboard thereby to enter data word by word into said data processing means,

functional control means establishing from the keyboard a variety of different manually selectable ones of said operating modes thereby to direct data processing manipulations on the entered data words in response to further ones of said unique signals,

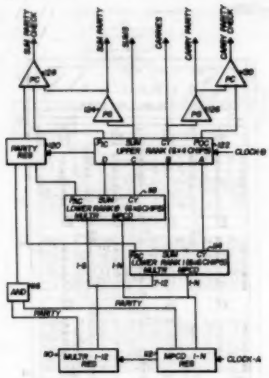
and means for displaying in the vicinity of the keyboard arrangement those operations by which data is processed by said data processing means in response to the functional control means and identity of the keyboard keys to be manually selected for entry of control signals effecting those operations.

4,549,280

APPARATUS FOR CREATING A MULTIPLICATION PIPELINE OF ARBITRARY SIZE

John R. Schomburg, New Brighton, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,130
Int. Cl.[4] G06F 11/10
U.S. Cl. 364—738 **14 Claims**



1. A multiply pipeline building block with parity checking capabilities comprising:

a. a multiplicand register;

b. a multiplier register;

c. multiple ranks of multiply gate arrays each rank connected to said multiplicand register and to said multiplier register;

d. a single rank of adder tree/register gate arrays connected to each of said multiple ranks of multiply gate arrays;

e. a first parity generating means and a second parity generating means each connected to said single rank of adder tree/register gate arrays;

f. a first parity checking means and a second parity checking means, said first parity checking means connected to said first parity generating means and to said single rank of adder tree/register gate arrays and said second parity checking means connected to said second parity generating means and to said single rank of adder tree/register gate arrays; and

g. said first parity checking means further coupled to said multiplicand register, and to said multiplier register, and to each of said multiple ranks of multiply gate arrays to provide circuitry for receiving parity signals there from and for checking parity within the multiply pipeline building block and thereby internally detecting single-bit errors.

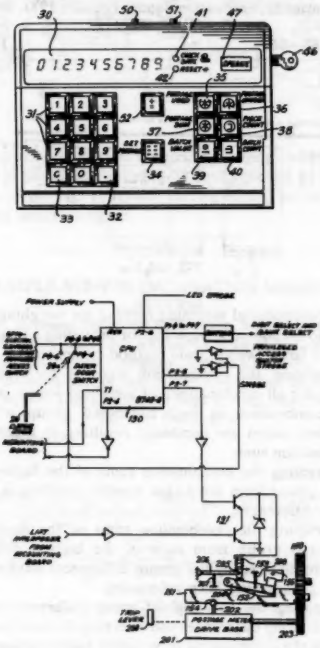
4,549,281

ELECTRONIC POSTAGE METER HAVING KEYBOARD ENTERED COMBINATION FOR RECHARGING

Alton B. Eckert, Norwalk, and Edward C. Duwel, Trumbull, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Feb. 21, 1985, Ser. No. 702,869
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 **12 Claims**

1. In a rechargeable electronic postage meter having a settable postage printing mechanism, signal input channel means for providing signals corresponding to numerical data including postage values to be set, recharging values, and combinations, digital computer means coupled to said signal input channel means and said printing mechanism to control the setting of said printing mechanism in accordance with the signals in said signal input channel means, said computing means including register means for storing funding data, said computer means further having a routine for carrying out the recharging of said meter, sealed switch means operatively connected to enable invoking said routine, and means including a breakable mechanical seal for inhibiting operation of said switch means, the improvement comprising non-volatile memory means for storing a fixed combination for said postage meter, further means for comparing a combination entered in said postage meter by way of said signal input channel means with said fixed combi-



nation, said computer means being connected to electronically inhibit said recharging of said register in the absence of an identity between said fixed combination and said entered combination and to enable said recharging by an amount corresponding to a recharging value entered along with said entered combination by way of said signal input channel means, said entered combination and said entered recharging value forming a combinational set, in the presence of said identity for recharging said meter.

4,549,282

MAGNETIC BUBBLE MEMORY SYSTEM

Sakan Takai, Kawasaki; Takenori Iida, Yokohama, and Keiichi Kaneko, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 6, 1983, Ser. No. 558,476
Claims priority, application Japan, Dec. 6, 1982, 57-212757
Int. Cl.[4] G11C 19/08
U.S. Cl. 365—1 **9 Claims**

1. A magnetic bubble memory system, comprising:

a plurality of magnetic bubble devices, each comprising:

at least one minor loop, having a predetermined bit length, for storing magnetic bubbles;

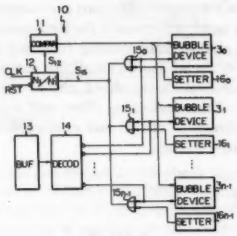
storage and read major lines for transporting the magnetic bubbles;

at least one information storage gate, between the storage

major line and a corresponding minor loop, for transferring the magnetic bubbles from the storage major line to the corresponding minor loop; and

at least one information read gate, between the corresponding minor loop and the read major line, for reading the magnetic bubbles from the corresponding minor loop to the read major line;

at least one page-allocation-designating means, corresponding to each of said magnetic bubble devices, for designating page allocation for accessing in one of a single-page mode and a multi-page mode each of said magnetic bubble devices; and



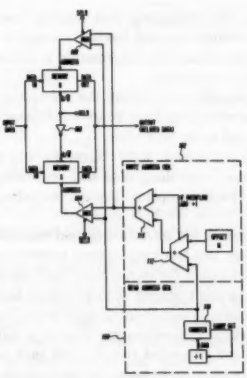
control-signal-generating means, operatively connected to said magnetic bubble devices and said page-allocation-designating means, for generating a signal which controls the transfer of the magnetic bubbles in the minor loop, the information storage gate and the information read gate in dependence upon the page allocation designated by said page-allocation-designating means for accessing the corresponding magnetic bubble device in the appropriate one of the single-page mode and the multi-page mode.

4,549,283

DIGITAL TIME DELAY CIRCUIT WITH HIGH SPEED AND LARGE DELAY CAPACITY

Thomas C. McDermott, III, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 6, 1983, Ser. No. 529,302
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—194 **6 Claims**



1. A digital time delay circuit, comprising:

an even number of memory devices, each of said devices including a plurality of storage locations with addresses forming an ordered set;

means for directing a write address to a first one of said memory devices, while directing a read address to a second one of said devices, then directing a write address to one of said devices different from said first one, while directing a read address to one of said devices different from said second one;

means for generating a sequence of said write addresses and a sequence of said read addresses, each of said sequences being formed by the repetition of a subset of said ordered set, said subset having an odd number of addresses,

whereby an offset between said write address sequence and said read address sequence can be selected to provide a delay, and

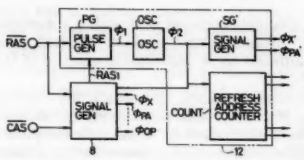
whereby the odd number of addresses in said subset permits utilization of adjacent storage locations in said memory devices.

4,549,284

DYNAMIC MOS RANDOM ACCESS MEMORY

Kunihiko Ikuzaki, Hinode, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 473,866
Claims priority, application Japan, Mar. 10, 1982, 57-36422
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222 **20 Claims**



1. A dynamic random access memory which includes memory cells that need to be periodically refreshed, internal circuits that are brought into precharged statuses and thereafter into operating statuses, and means for accessing said memory cells in response to an address strobe signal that is supplied said dynamic random access memory, said dynamic random access memory comprising:

a pulse generator which generates refresh pulses upon detecting inhibition of the supply of the address strobe signal to said dynamic random access memory; and

an address counter which forms refresh address data by counting the refresh pulses,

wherein a refresh timing of the memory cells specified by said address counter is determined by the refresh pulses in accordance with the inhibition of said address strobe signal to said dynamic random access memory.

4,549,285

APPARATUS FOR REAL TIME CORRELATION IN SEISMIC PROSPECTION

Claude Fleurance, Saint Julien de Concelles, and Jean-Claude Naudot, Carquefou, both of France, assignors to Societe d'Etudes, Recherches et Constructions, France

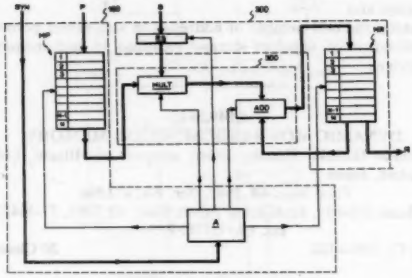
Filed Jul. 7, 1982, Ser. No. 396,008
Claims priority, application France, Jul. 8, 1981, 81 13433
Int. Cl.[4] G01V *1/36, 1/28*
U.S. Cl. 367—60 **6 Claims**

1. In a system for seismic prospecting of subsoil by vibration, comprising:

a source of controlled vibrations;

at least one seismic channel comprising a seismic pick-up for receiving reflecting signals from the subsoil, and means for sampling and digitizing the signal received by the pick-up into successive picked-up samples;

means for exciting the source by a pilot signal;
means for sampling and digitizing the pilot signal into successive pilot samples; and
digital recording means for recording signals derived from the pilot samples and picked-up samples,
an apparatus for providing real time correlations for said seismic channel comprising:
a buffer for storing N samples of the pilot signal, N being a number of samples associated with a time T corresponding to the predetermined degree of investigation;
at least one buffer for storing one sample of the received signal;



at least one calculation circuit comprising a multiplication circuit for producing the products of each picked-up sample multiplied by N consecutive samples of the pilot signal;
at least one result memory, into which are cumulatively introduced N product sums respectively corresponding to correlations of the picked-up signal with the pilot signal, each of said correlations being determined as a function of a respective, variable time lag;
a circuit for addressing the pilot signal buffer, the result memory, and also cooperating with said calculation circuits.

4,549,286

INTERFERENCE SUPPRESSION UNIT FOR A SONAR APPARATUS

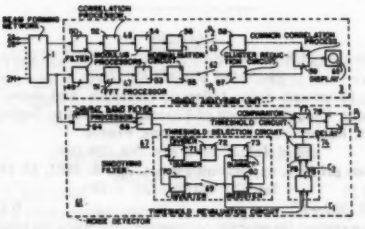
Huibert B. Langeraar, and Alexander P. M. Van Der Schoot, both of Hengelo, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Feb. 22, 1983, Ser. No. 468,722

Claims priority, application Netherlands, Feb. 24, 1982, 8200728

Int. Cl.⁴ G01S *7/66, 15/06*

U.S. Cl. 367—97 **7 Claims**



1. Sonar apparatus comprising a beamforming network and a signal analysing circuit, where the beamforming network comprises a plurality of receiving channels with synchronously active sound detection elements and band filter means for supplying, for each direction of beam incidence, digital composite signal products relative to the sound energy from the sound detection elements, said signal products being obtained by superposition of the receiving channel output signals, the beamforming network further comprising frequency transformation means for transforming the composite signal products to a low-frequency band, characterized in that the sonar apparatus comprises blocking circuits responsive to the signal analysing circuit, and a noise detector supplied with the composite signal products for deriving, for each direction of beam incidence, a blocking circuit control voltage from the information about interference signals as contained in the composite signal products, wherein the noise detector comprises: a continuous network of a digital band filter for selecting signals outside the low-frequency band part representing the transmitting/receiving band; a processor for determining the modulus of the filtered signals; a smoothing filter for determining the average value of the measured amplitude samples supplied in a certain time interval; a threshold circuit supplied with the average value of the smoothing filter; and a comparator connected to the threshold circuit and to the processor for generating said control voltage.

4,549,287

SYSTEM FOR RECORDING AND PLAYING BACK INFORMATION WITH MAGNETO-OPTICAL DISK MEMORY USING RECORD AND READOUT LIGHT BEAMS OF DIFFERENT WAVELENGTHS

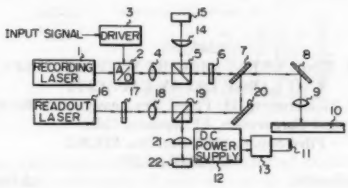
Hideki Hatano; Norikiyo Tajiri; Sakashi Ōtaki, and Shigeru Kato, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,312

Claims priority, application Japan, Aug. 6, 1981, 56-123223

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—45 **3 Claims**



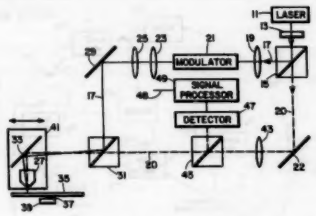
1. A system for recording and playing back information utilizing a recording medium having a vertical magnetization film on and from which the information is recorded and readout, the system comprising:
means for rotatably supporting the recording medium;
a source of a recording light beam modulated in accordance with a signal to be recorded;
a source of a readout light beam having a wavelength shorter than a wavelength of said recording light beam;
a focus and tracking optical system including an objective lens;
a first optical path for introducing said recording light beam to said focus and tracking optical system; and
a second optical path for introducing said readout light beam to said focus and tracking optical system and for introducing a reflection of said readout light beam from the surface of said vertical magnetization film to a light detector to reproduce the recorded signal, both said recording light beam and readout light beam being focused on the surface of said vertical magnetization film by said objective lens and said recording light beam having a greater diameter on the surface of said vertical magnetization film than said readout light beam.

4,549,288

APPARATUS FOR ENHANCING THE PLAYBACK SIGNAL IN AN OPTICAL DATA RECORDING SYSTEM

Albert Y. Chan, River Vale, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,837
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—48 **5 Claims**



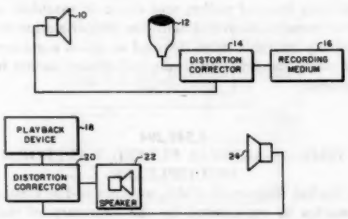
1. Apparatus for enhancing the playback signal in an optical recording system in which a read beam impinges on a record carrier having data stored on it in the form of pits and lands, said system producing in response to said read beam impinging on said pits and lands a signal which alternates in accordance therewith; said apparatus including clipping means clipping said alternating signal to produce signal pulses representative of said lands and pits; pulse converting means converting said signal pulses into two sawtooth waves, one having amplitudes representing the lengths of said pits, the other having amplitudes representing the lengths of said lands; comparator means comparing said one sawtooth wave with said other and producing an error signal; and feedback means using said error signal to improve said alternating signal so that it represents said data more accurately.

4,549,289

METHOD FOR CORRECTING ACOUSTIC DISTORTION

Jack Schwartz, and Tai T. Wu, both of 147 Ridge St., Arlington, Mass. 02174

Filed Jun. 20, 1983, Ser. No. 505,837
Int. Cl.⁴ G11B *27/36*; G10K *11/00*
U.S. Cl. 369—53 **12 Claims**



1. A method of correcting acoustic distortion in an audio signal introduced by room environment comprising the steps of

introducing an acoustic test impulse into said room environment at a first predetermined location therein;

detecting said acoustic test impulse at a second predetermined location in said room environment to thereby provide a room response signal representing said acoustic test impulse as distorted by the acoustic properties of said room environment;

calculating the reciprocal of said room response signal to provide a set of equalizing values; and

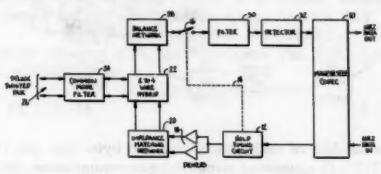
applying said equalizing values to said audio signal to thereby provide an equalized audio signal wherein the distortion introduced by said room environment is substantially eliminated.

4,549,290

VOICE/DATA DIGITAL, DUPLEX LINK

David B. Bell, 1098 Saint Joseph Ave., Los Altos, Calif. 94022

Filed Jun. 10, 1983, Ser. No. 503,033
Int. Cl.⁴ H04B *3/20*; H04M *9/08*
U.S. Cl. 370—32 **10 Claims**



1. Link apparatus connected to one end of a pair of communication lines for simultaneously sending and receiving digital data over the lines, the link apparatus comprising:

a transmitting circuit for generating digital signal pulses and for transmitting them over the pair of communication lines and including means for detecting each change of state of said digital signal pulses and for generating a control signal pulse at each such change of state,

a receiving circuit for receiving data signals generated by an external source and transmitted over the communication lines to the link apparatus, the receiving circuit comprising means for discriminating between data signals received over the communication lines and the digital signal pulses generated by the transmitting circuit and for outputting said data signals, controllable switch means supplied with the control signal pulse for interrupting the outputting of said data signals by the discriminating means in response to the control pulse, and storage means for storing the value of the last received data signal from the external source prior to the interruption by the switch means, and wherein the switch means is connected in series between the discriminating means and the storage means.

4,549,291

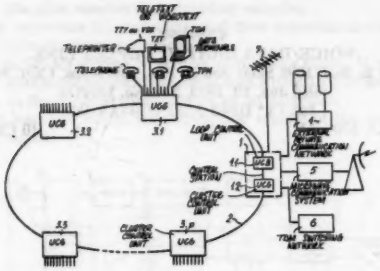
HYBRID LOCAL COMMUNICATION NETWORK, OPERATING BOTH IN CIRCUIT AND PACKET MODES

Roger J. Renoulin, 29, rue René Jean Magneux, Thorigné-sur-Vilaine, 35510 Cesson Sévigné; Jean P. Lefranc, 18, rue de Brest, Apt. B 234, and Tahar Takhedmit, 12, rue Saint Yves, both of 35000 Rennes, all of France

Filed Sep. 9, 1983, Ser. No. 531,168
Claims priority, application France, Sep. 24, 1982, 82 16632
Int. Cl.⁴ H04J *11/04, 3/00*
U.S. Cl. 370—89 **42 Claims**

1. A hybrid local communication network operating both in circuit and packet modes with a loop carrying a TDM multiplex for interconnecting a number of terminals connected to the loop, the communications in packet mode being controlled by a token byte, the header for each packet comprising the address of the called station and the address of the calling station, wherein the TDM multiplex is arranged in multiframes comprising N frames ϕ–(N−1), each frame comprising P byte time slots iTϕ–iT(P−1) for transmitting a packet per frame, the byte time slot iTϕ in each frame containing the frame alignment pattern of the frame, the byte time slot iT1 containing the frame packet token byte, the byte time slots IT2–iTh

containing the packet header, the byte time slots iT(h+1)–iTx (where x generally indicates any suitable number) containing



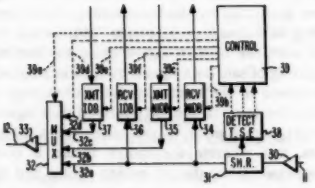
the useful data of said packet, and the byte time slot iT(x+1)-iT(P−1) containing circuit type communication data.

4,549,292

METHOD OF EFFICIENTLY AND SIMULTANEOUSLY TRANSMITTING BOTH ISOCHRONOUS AND NONISOCHRONOUS DATA IN A COMPUTER NETWORK

David L. Isaman; Ronald S. Perloff, both of San Diego, and Christopher J. Tomlinson, Encinitas, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1984, Ser. No. 581,350
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—89 **11 Claims**



1. A method of transmitting both isochronous and nonisochronous data through the stations of a computer network in which a plurality of stations have respective input and output ports that are serially coupled together to form a loop; said method including the steps of:

transmitting data characters of a nonisochronous frame from a first station in said loop;

passing the data characters from said first station through a second station in said loop and inserting a pair of spaced apart control characters between any two data characters during the passing step indicating the beginning and end of an isochronous frame within said nonisochronous frame;

passing the data characters and control characters from said second station through a third station on said loop and writing an isochronous character generated from said third station into the space between said control characters;

temporarily stopping said transmitting step in said first station in response to the receipt of one of said control characters to pass the isochronous frame through said first station; and

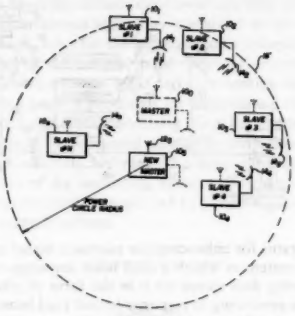
proceeding, in said first station, with said transmitting of said nonisochronous frame after passing said isochronous frame.

4,549,293

TIME DIVISION MULTIPLE ACCESS COMMUNICATIONS SYSTEM

J. Robert Christian, Oceanport, and Louis C. Poli, Hazlet, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,767
Int. Cl.[4] H04J *3/16, 3/06;* H04B *1/00, 7/00*
U.S. Cl. 370—95 **13 Claims**



1. A time division multiple access communication system including a non-permanently committed master station and at least two slave stations communicating with one another through the master station, comprising:

a plurality of indentical transceivers utilizing the same operational frequency near a region of high atmospheric signal attenuation, one of said transceivers operating a master station and the other transceivers operating as slave stations within line of sight communication to said master station,

each of said transceivers including an omnidirectional antenna providing operation as a master station and a directional antenna providing operation as a slave station, and means for selectively connecting one of said antennas for operation of each transceiver as a master station capable of communication with each slave station or as a slave station capable of communication only with said master station, and

wherein said one transceiver operating as the master station establishes a covert power circle of operation with the remainder of said transceivers acting as slave stations geographically located within said circle to establish a line of sight communications link with the master station but being selectively operable upon demand to act as a master station in the event the previously selected master station becomes inoperable.

4,549,294

TIME-OF-ARRIVAL PULSED WAVEFORM MULTIPLEXER

Karl D. Stickel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1984, Ser. No. 588,486
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—111 **4 Claims**

1. Apparatus for multiplexing selected information contained in first and second pulse waveform signals transmitted on first and second input lines over a single output data line where said first signal includes periods of activity and inactivity, said active periods being periods during which the voltage of said first signal exceeds a predetermined voltage, comprising:

a first detector connected to said input line for detecting a pulse in said second signal;

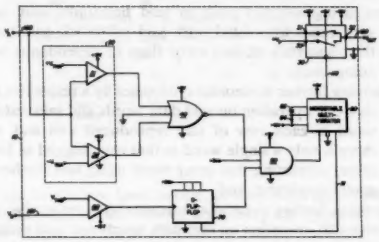
switch means for selective transmission of said first signal or a constant voltage signal of a value in excess of the maximum

voltage level of said first signal in response to a switching signal applied thereto;

a second detector for detecting said periods of activity and inactivity in said first signal connected to said first input line;

a first logic gate connect to said second detector for producing an enabling signal when said first line is inputting a period of inactivity;

a flip-flop connected to said first detector for producing a control-signal indicative of the detection of a pulse in said second signal said control signal continuing until cleared by a clearing pulse;



a second logic gate connected to said first logic gate to receive the enabling signal output thereof and to said flip-flop to receive the control signal output thereof for producing a trigger signal output in response to concurrent receipt of the enabling signal and the control signal; and

a monostable multivibrator connected to said second logic gate for receipt of said trigger signal therefrom and connected to said flip-flop for outputting a signal thereto and connected to said switch means for supplying a switching signal thereto.

4,549,295

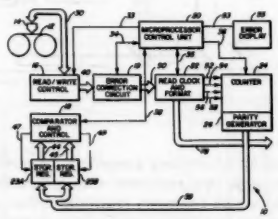
SYSTEM FOR IDENTIFYING DEFECTIVE MEDIA IN MAGNETIC TAPE STORAGE SYSTEMS

Dwayne E. Purvis, Vienna, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1983, Ser. No. 506,552

Int. Cl.[4] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—13 **6 Claims**



1. In a magnetic storage system including a microprocessor wherein data read/write operations are carried out by data read/write means upon magnetic storage media in data blocks, and wherein the system further includes error correction circuit means for detecting and correcting errors and identifying uncorrectable errors,

counter means for monitoring error locations in a given data block as well as counts corresponding to the tape location of such errors, including uncorrectable errors,

means for storing the locations and counts corresponding to occurrence of an uncorrectable error,

means responsive to the error correction circuit means for retrying a read or write operation to eliminate the error, and means for comparing the recorded error counts for initial and retry operations to identify when a match of count values occurs, and

means for evaluating the existence of matched error conditions to isolate tape media caused errors from hardware caused errors.

4,549,296

DEVICE FOR REPORTING ERROR CONDITIONS OCCURRING IN ADAPTERS, TO THE DATA PROCESSING EQUIPMENT CENTRAL CONTROL UNIT

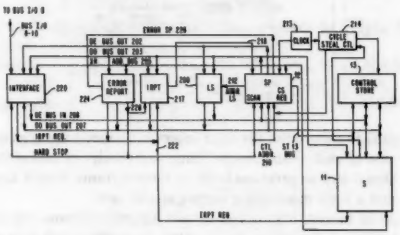
Rene Castel, Vence; Gerard Dalboussiere, La Colle-sur-Loup, and Michel Kulakowski, Carros, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 18, 1983, Ser. No. 524,492

Claims priority, application European Pat. Off., Aug. 30, 1982, 82430023.0

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **8 Claims**



1. In data processing equipment having adapter means, a device located in each adapter for reporting error conditions occurring in the adapters (**10**), to the central control unit of said adapters (**10**) being of the type including a microcode controlled microprocessor (**12**) provided with input and output buses and having an internal error register (**420**) and error detection circuits (**400, 226**), characterized in that it comprises:

storing means (**XR03**) for storing error conditions detected by the error detection circuits,

error condition classification means (**402** and **404**) which receive error conditions from the storing means and give two indications: the first one being indicative that at least one error condition affecting the microcode integrity, has occurred, and the second one being indicative that at least one error condition not affecting the microcode integrity, has occurred,

generation means (**406, 408**) for generating a HARD STOP signal responsible to the first indication so as to cause the microprocessor operation to be stopped,

first transfer means (**422**, FIG. **7**) for sending the error conditions to the central control unit when the hard stop signal is active,

second transfer means (FIG. **8**) for sending the contents of the internal error register (**420**) to the central control unit when the hard stop signal is active.

4,549,297

DATA RETRANSMITTING SYSTEM

Masato Nishimoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,466

Claims priority, application Japan, Mar. 8, 1982, 57-35176

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—33 **10 Claims**

3. A data transmitting system wherein data is transmitted in data frames and an answer signal is transmitted back from the signal receiving side upon reception of each data frame comprising:

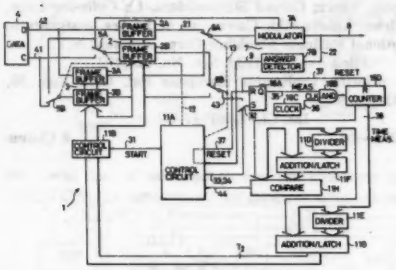
first means to store data and produce a measurement frame output having a first predetermined frame length;

second means to store data and produce a data frame output having a second predetermined frame length;

interface means to transmit a data frame output and a measuring frame output, and to receive an answer signal;

first switch means to switch the input of data from a data source to either said first or second means to store data;

second switch means to couple the outputs of either said first or said second means to store data to said interface means;



means to determine the time interval between the transmission of said measurement frame and receipt of said answer signal and to produce both an output frame length signal and a time monitoring output signal; and

control means, responsive to said interface means and said means to determine the interval, to control said first and second switch means, said control means providing said frame length signal as a control signal, to said first and second means to store data, for controlling the output of data as a function of said time monitoring output signal.

4,549,298

DETECTING AND CORRECTING ERRORS IN DIGITAL AUDIO SIGNALS

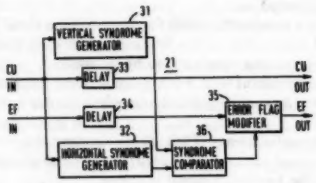
David M. Creed, and John G. S. Ive, both of Basingstoke, England, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,189

Claims priority, application United Kingdom, Jun. 29, 1982, 8218727

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—40 **14 Claims**



1. A method of detecting and correcting errors in digital audio signals, the method comprising the steps of:

assembling digital words, each of which corresponds to a digital audio signal representing a sample of an analog audio signal, into units consisting of m rows by n columns of said data words;

assembling with each said unit a plurality of redundant words derived by a respective exclusive-OR operation on said data words in each row and each column of said unit;

shuffling the order of said data words and said redundant words and then assembling the shuffled words into sub-blocks, deriving from said words in each said sub-block a plurality of error detection code words and adding said code words to the respective sub-block;

recording and reproducing each said sub-block;

after reproduction, using said code words of each said sub-block to set the logic state of error flags that have been added to each said word in said sub-block;

de-shuffling the order of said shuffled words and then reforming said units and assembling with each said reproduced unit a plurality of horizontal and vertical syndromes derived by a respective exclusive-OR operation on said data words and said redundant word in each row and each column of said unit;

comparing selected ones of said horizontal and vertical syndromes associated with said sub-block and resetting the logic state of said error flags in dependence on said comparison;

deriving further horizontal syndromes by a respective exclusive-OR operation on said data words and said redundant word in each row of said reproduced unit and, where there is only a single word in that row flagged as being in error, correcting that error word using said further horizontal syndrome; and

deriving further vertical syndromes by a respective exclusive-OR operation on said data words and said redundant word in each column of said reproduced unit and, where there is only a single word in that column flagged as being in error, correcting that error word using said further vertical syndrome.

4,549,299

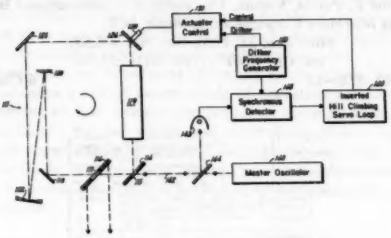
REVERSE WAVE RING RESONATOR CONTROL SYSTEM

Gary E. Palma, Bloomfield, and Albert W. Angelbeck, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 14, 1983, Ser. No. 475,276

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—18 **2 Claims**



1. A system for controlling a regenerative power amplifier having an unstable ring resonator with a variable resonator cavity length, which resonates radiation in forward and reverse directions to lock the power amplifier to a master oscillator comprising:

deflecting means for deflecting a portion of said radiation resonated in said reverse direction out of said unstable resonator;

an optical detector, positioned to intercept said deflected reverse radiation, for providing a detector signal representative of the power of said deflected reverse radiation;

means for passing said detector signal to a servo loop control;

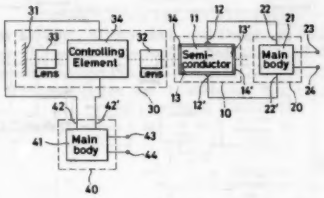
a servo loop control, connected to said means for passing said detector signal, for receiving said detector signal and forming therefrom a control signal for controlling said variable resonator cavity length to minimize said detector signal; and

control means for receiving said control signal and varying said variable length in response thereto.

4,549,300
SEMICONDUCTOR LASER DEVICE

Yoshinobu Mitsuhashi, and Junichi Shimada, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 22, 1983, Ser. No. 477,856
Claims priority, application Japan, Jun. 24, 1982, 57-109047
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—50 **3 Claims**

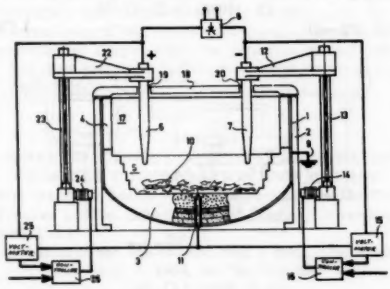


1. A semiconductor laser device, comprising a semiconductor laser having a semiconductor containing a p-n junction and opposite output end faces constituting a laser resonator, said end faces provided with an antireflection coating having a reflectance at said end faces less than 0.1, a power source for controlling the injection current to said semiconductor laser so that the semiconductor laser emits a laser beam, an optical system arranged so as to reflect and return the beam emitted from one of said output end faces of said semiconductor laser back to said one of said output end faces thereby inducing self-coupling effects of said laser, and an element for controlling the polarization characteristics of the laser beam reflected by said optical system.

4,549,301
DIRECT-CURRENT ELECTRIC-ARC FURNACE AND METHOD OF OPERATING SAME

Jean-Pierre Motte, and Ghislain Maurer, both of Metz, France, assignors to Institute de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-En-Laye and Clecim, Courbevoie, both of, France

Filed Jun. 1, 1983, Ser. No. 499,908
Claims priority, application France, Jun. 1, 1982, 82 09486
Int. Cl.⁴ H05B *7/20*
U.S. Cl. 373—108 **3 Claims**

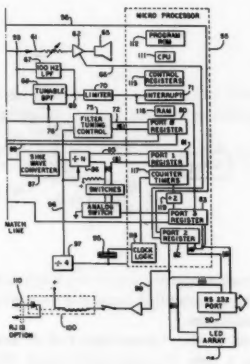


1. An electric arc furnace comprising:
a vessel adapted to hold a charg of metal to be melted;
a vertically displaceable positive electrode spaced vertically above the charge in the vessel;
a vertically displaceable negative electrode spaced horizontally from the positive electrode and vertically above the charge in the vessel;
direct-current power-supply means for oppositely energizing the electrodes and thereby drawing one arc between the positive electrode and the charge and another arc between the negative electrode and the charge;
a probe in the vessel underneath the electrodes and in electrical contact with the charge;
measuring means connected to the respective electrodes and to the probe for detecting the potential difference between the respective electrode and the charge; and
means connected to the measuring means and to the vertically displaceable electrodes for changing the vertical spacing between each of the electrodes and the charge in the furnace in accordance with the respective detected potential difference in such a manner as to maintain the potential difference between each electrode and the charge at a predetermined value.

4,549,302
MODEM WITH IMPROVED ESCAPE SEQUENCE MECHANISM TO PREVENT ESCAPE IN RESPONSE TO RANDOM OCCURRENCE OF ESCAPE CHARACTER IN TRANSMITTED DATA

Dale A. Heatherington, Decatur, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Division of Ser. No. 449,464, Dec. 13, 1982, Pat. No. 4,431,867, which is a division of Ser. No. 273,398, Jun. 19, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,540
Int. Cl.⁴ H04M *11/08*
U.S. Cl. 375—8 **5 Claims**



1. In a modem including a data input port for connecting said modem to a utilization device, and a telephone port for connecting said modem to a telephone line; said modem being of the type having two distinct modes of operation:
(a) a transparent mode of operation for which said modem provides modulated signals to said telephone port in response to data signals provided to said data input port; and
(b) a command mode of operation for which said modem responds to said data signals provided to said data input port as instructions to said modem;
said modem including means defining a predetermined sequence of said data signals as an escape character; the improvement comprising:
timing means for detecting each occurrence of a passage of a predetermined period of time after provision of one of said data signals to said data input port; and
means, operative when said modem is in said transparent mode of operation, for detecting provision of said predetermined sequence of said data signals, and for causing said modem to switch to said command mode of operation, if and only if said predetermined sequence of data signals occurs contiguous in time with at least one said occurrence of said passage of said predetermined period

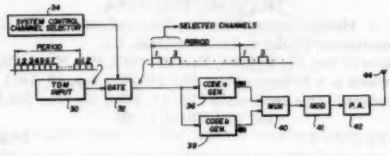
of time during which none of said data signals are provided to said data input port.

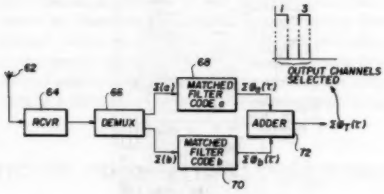
4,549,303

MULTICHANNEL TIME DIVISION MULTIPLEXED TRUNK TRANSMISSION LINK

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1983, Ser. No. 565,806
Int. Cl.[4] H04J *3/10, 13/00*
U.S. Cl. 375—25 **9 Claims**





2. A multichannel time division multiplexed communications system including a transmitting end and a receiving end, comprising in combination:

means located at the transmitting end of said system for generating a time division multiplexed bit stream of a plurality of communications channels in respective time slots of a time frame period;

channel selector control means for selecting a predetermined number of channels less than said plurality of communications channels to be transmitted to the receiving end of said system;

means coupled to said bit stream generating means and being controlled by said channel selector control means for enabling said predetermined number of channels to be provided as respective bits of said bit stream in each frame period;

means responsive to each bit of said bit stream for generating a pair of noise coded signals;

means for multiplexing said noise coded signals and transmitting multiplexed noise coded signals to said receiving end;

means located at said receiving end for demultiplexing said multiplexed noise coded signals whereby said pair of noise coded signals are again provided;

noise code detector means coupled to said pair of noise coded signals for providing a first and second intermediate output signal; and

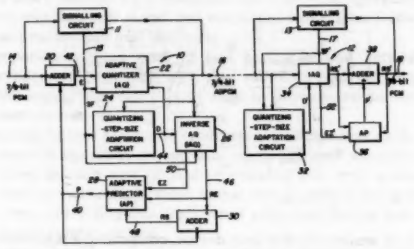
means for combining said first and second intermediate output signals to provide composite output signals of said selected channels.

4,549,304

ADPCM ENCODER/DECODER WITH SIGNALLING BIT INSERTION

Andreas H. Weirich, and Leo Strawczynski, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 28, 1983, Ser. No. 555,359
Int. Cl.[4] H03K *13/22*
U.S. Cl. 375—27 **5 Claims**



1. An ADPCM transmission system in which ADPCM signal channels are multiplexed in t.d.m. frames each providing n bits for transmission of each channel, the frames comprising, in addition to regular frames, signalling frames in which m of the n bits of each channel are provided for the transmission f additional information, where n and m are integers and $n>m>0$, the system comprising:

means for providing an indication of each signalling frame;

ADPCM signal encoding means responsive to said indication for producing n-bit ADPCM signals in the regular frames and (n-m)-bit ADPCM signals in the signalling frames; and

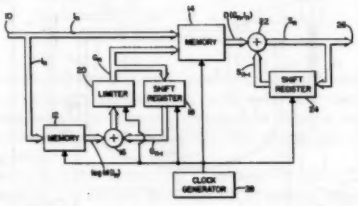
ADPCM signal decoding means responsive to said indication for decoding n-bit ADPCM signals in the regular frames and (n-m)-bit ADPCM signals in the signalling frames.

4,549,305

ADAPTIVE DIFFERENTIAL PCM DECODER

Katsunobu Fushikida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,647
Claims priority, application Japan, May 14, 1982, 57-80921
Int. Cl.[4] H03K *13/22, 13/01*
U.S. Cl. 375—27 **1 Claim**



1. An adaptive differential PCM decoder for receiving adaptive differential PCM input codes and for reproducing a replica of an original waveform, said decoder comprising:

a first multiword memory in which a plurality of differential values is stored, said first memory receiving said input codes and step size codes;

a second multiword memory in which a plurality of step size control codes is stored, said second memory receiving said input codes and outputting the step size control code selected on the basis of the received input code;

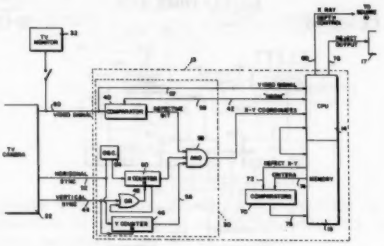
a circuit interconnecting said first and second memories, said circuit including an adder which adds a signal which is indicative of the current output of the second memory plus a previous output of the adder, said first memory outputting a differential value selected on the basis of said input codes and the output of said adder; and

a waveform reproducing circuit for receiving the output of said first memory and for reproducing the replica.

4,549,306
SHEET METAL EVALUATOR

Anthony Shideler, Albany, Ind., and Dwight B. Raddatz, Woodridge, Ill., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 410,423, Aug. 23, 1982, abandoned. This application Apr. 1, 1985, Ser. No. 718,821
Int. Cl.[4] G01T *1/16*
U.S. Cl. 378—58 **8 Claims**



1. A method of inspecting a metal sheet for invisible imperfections, comprising:

exposing the metal sheet to X-rays having sufficient energy to penetrate the metal sheet;

providing an image proportional to the intensity of X-rays that penetrate said metal sheet;

scanning said image and converting said image into a first electrical signal which varies from point to point during the scan depending upon the intensity of the X-rays that penetrate said metal sheet at each point on said sheet;

comparing said first electrical signal with a second electrical signal representing a norm for identifying defective bits for points on said sheet wherein said corresponding first electrical signal departs from said norm;

generating signals corresponding to the X-Y coordinates or said sheet of said defective bits;

comparing said defective bits corresponding to the X-Y coordinates of said sheets with stored criteria; and

providing an output when the departure of said defective bits from said norm has characteristics similar to a metal imperfection.

4,549,307
X-RAY IMAGING SYSTEM HAVING RADIATION SCATTER COMPENSATION AND METHOD

Albert Macovski, Menlo Park, Calif., assignor to The Board of Trustees of The Leland Stanford, Junior University, Palo Alto, Calif.

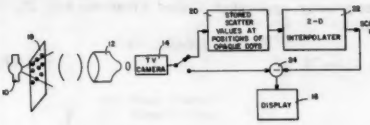
Continuation of Ser. No. 415,333, Sep. 7, 1982,. This application Aug. 9, 1984, Ser. No. 639,268
Int. Cl.[4] G03B *41/16*
U.S. Cl. 378—145 **6 Claims**

1. A two-dimensional volumetric projection x-ray imaging system comprising

an x-ray source,

a two-dimensional x-ray detector means positioned to receive and detect x-radiation from said source and generate an electrical signal indication thereof,

radiation shield means positioned between said source and an object being imaged and said detector means for shielding radiation from passing directly through the object to shielded areas of said detector means, said shield means comprising a plurality of radiation opaque bodies positioned between said source and the object being imaged and said detector means and spatially distributed within the imaging area of said detector means for facilitating two-dimensional interpolation of a scattered radiation signal for all of the detector means area,



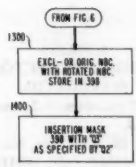
interpolation means for receiving electrical signals from said detector means indicative of scattered radiation received by said shielded area of said detector means and interpolating therefrom a scattered radiation signal for all of said detector means, and

means for subtracting said interpolated scattered radiation signal from said electrical signal generated by said detector means.

4,549,308
SECURE MOBILE RADIO TELEPHONY

Frank J. LoPinto, Chicago, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 12, 1982, Ser. No. 397,131
Int. Cl.[4] H04L *9/00*
U.S. Cl. 455—26 **6 Claims**



4. An arrangement for generating an encryption key for encrypting communications between a mobile radiotelephone unit and a base station capable of communicating over any of a group of changeable communications channel frequencies, said radiotelephone unit having an original, machine-readable plural bit nonbroadcast code, comprising:

means for storing an indication of a currently in-use one of said communications channel frequencies and of another of said communications channel frequencies,

means responsive to each said stored indication for identifying a respective set of bit positions in said original machine-readable nonbroadcast code,

means for performing a binary operation on the contents of each said set of bit positions to derive a further set of bit values, said further set being distinctive from each said set,

means for providing an altered version of said machine-readable nonbroadcast code in accordance with said further set of bit values, and

means for exclusively-ORing said original machine-readable nonbroadcast code with said altered version to produce said encryption key.

4,549,309

RADIO TRANSMITTING AND RECEIVING APPARATUS

Nigel M. Corrigan, 25 Hyde Park Gate, Seletar Airbase, Singapore (2879)

Continuation-in-part of Ser. No. 482,507, Apr. 6, 1983, abandoned, which is a continuation of Ser. No. 296,181, Aug. 25, 1981, abandoned. This application Oct. 18, 1983, Ser. No. 545,611

Claims priority, application United Kingdom, Aug. 28, 1980, 8027863

Int. Cl.[4] H04B *1/44*

U.S. Cl. 455—78 **6 Claims**

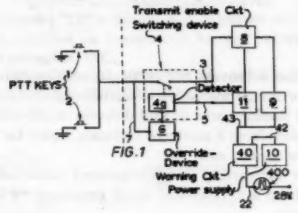


FIG. 1

1. In a simplex radio transmitting and receiving apparatus comprising a selector switch means, operation of which causes the apparatus to change from a receiving mode into a transmitting mode, transmission blocking means arranged to prevent selection of the transmitting mode if a signal of predetermined strength is being received by the apparatus at the time the selector switch means is operated, and an over-ride circuit whereby operation of the transmission blocking means may be selectively over-ridden to enable the transmitting mode to be selected, the improvement which comprises means within said over-ride circuit responsive to a control signal generated by said selector switch means to initiate operation of said over-ride circuit, and means within said over-ride circuit responsive to return of said selector switch means to select the receiving mode of the apparatus to terminate operation of said over-ride circuit.

4,549,310

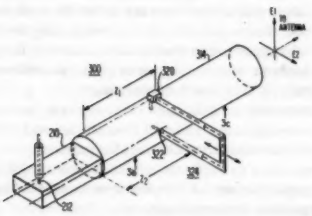
CROSS-POLARIZATION CORRECTOR FOR CIRCULAR WAVEGUIDE

Oakley M. Woodward, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,824

Int. Cl.[4] H04B *1/04*; H01P *1/16*

U.S. Cl. 455—129 **11 Claims**



1. A transmission line comprising:

circular waveguide means adapted for propagating a signal in the form of a first polarized electromagnetic signal in a longitudinal direction through said waveguide means, said waveguide means having unavoidable size variations which result in undesired generation of a cross-polarization signal which accompanies said first polarized signal;

first coupling means coupled to said circular waveguide means for extracting a sample of said first polarized signal from said waveguide means and producing a sample signal;

second coupling means coupled to said circular waveguide means for coupling to said cross-polarization signal; and

third coupling means coupled to said first and second coupling means for coupling said sample signal to said second coupling means with an amplitude and phase to reduce said cross-polarization signal.

4,549,311

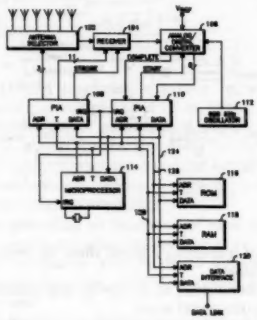
METHOD AND APPARATUS FOR MEASURING THE STRENGTH OF A RADIO SIGNAL FREQUENCY

Michael J. McLaughlin, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 405,123, Aug. 3, 1982, abandoned. This application Mar. 20, 1985, Ser. No. 714,063

Int. Cl.[4] H04B *7/08*

U.S. Cl. 455—277 **30 Claims**



21. A method of determining for each radio channel the strength of the radio frequency (RF) signal experiencing Rayleigh fading and received by a plurality of antennas from a plurality of remote stations each having an unknown location in a geographical area and transmitting on a different radio channel, each of said antennas receiving RF signals from the geographical area and couplable to receiving means having an output signal, said method comprising the steps of:

(a) tuning said receiving means to each of the radio channels in sequence; and

(b) for each radio channel:

(i) coupling said receiving means to each antenna in a predetermined sequence;

(ii) sampling the receiving means output signal N times while coupled for a predetermined time interval to each antenna, where N is an integer number greater than one; and

(iii) after sampling all antennas, selecting the sample which has a magnitude greater than the magnitude of any of the other samples.

4,549,312

RADIO RECEIVER WITH AUTOMATIC INTERFERENCE AND DISTORTION COMPENSATION

Sheldon B. Michaels, Acton, and Mark J. Giubardo, Chelmsford, both of Mass., assignors to Digital Marine Electronics Corporation, Acton, Mass.

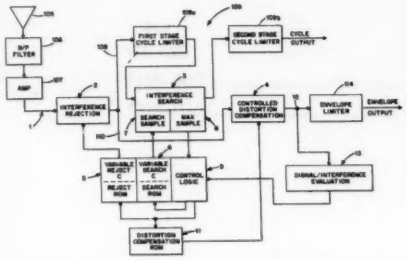
Filed Feb. 29, 1980, Ser. No. 125,973

Int. Cl.[4] H03B *1/04*; H04B *1/12*

U.S. Cl. 455—311 **34 Claims**

1. In a radio receiver having an input and an output for receiving desired signals in a predetermined frequency band and automatic tuning apparatus for rejecting a narrow band of undesired received signals among the desired signals in the

electrical path of the receiver from said input to said output, including: means in said electrical path for detecting the presence of said undesired narrow band signals among the received signals and producing an output representative thereof, a variable narrow band reject filter in said electrical path of received signals between said detecting means and said input and feedback means controlled by the output of said detecting means producing a feedback output for varying the center frequency of said reject filter to set said center frequency at the undesired narrow band, so that the undesired signals are substantially eliminated from the received signals from the output of said electrical path, the improvement comprising,



(a) means in said electrical path for compensating for the distortion of said desired signals following said reject filter, including:

(b) a delay and add circuit in said electrical path having a delay circuit and an add circuit therein each having an input and an output, said add circuit adding together the input and the output of said delay circuit, and

(c) distortion compensating means for controlling and varying said delay and add circuit depending on the center frequency of the reject filter,

(d) said distortion compensating means being controlled by said feedback output.

4,549,313

SUPERVISORY DEVICE FOR AN OPTOELECTRONIC SWITCHING NETWORK

Boris Rozenwaig, 8, rue P. J. Redouté 92360 Meudon la Foret, France

Filed Feb. 3, 1983, Ser. No. 463,657
Claims priority, application France, Feb. 3, 1982, 82 01737
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—600 **4 Claims**

1. An optoelectronic switching network comprising:

a transmit board formed by a plurality of transmit units each including a light source, said light sources being connected respectively to subscriber incoming lines and being arranged matrically in said transmit board;

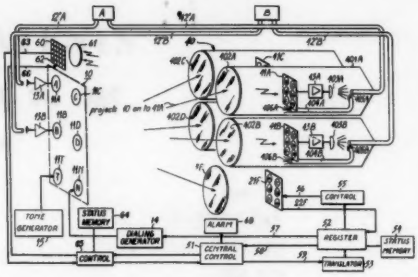
a receive board formed by a plurality of receive units, each receive unit including plural optoelectronic cells, said cells being selectively connectable to subscriber outgoing lines and being arranged matrically in said receive units;

an optical system for projecting an image of the transmit board onto the receive units so that in each receive unit images of the sources of the transmit board coincide with the optoelectronic cells of said receive units;

each receive unit further including illuminating means for projecting an image in response to any cell of the particular receive unit being illuminated by an image of the transmit board by way of the optical system;

a supervision receive unit in proximity to the transmit board with supervision optoelectronic cells having projected thereon images from the illuminating means of the receive units;

means for scanning said supervision optoelectronic cells; and



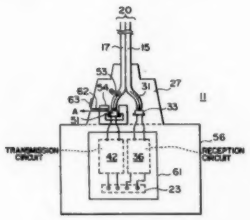
each of the receive units comprising: (a) a housing internally coated with a reflecting layer, and (b) receive unit illumination means controlled by the activation of the optoelectronic cells of the receive unit.

4,549,314

OPTICAL COMMUNICATION APPARATUS

Shunichi Masuda, Kawasaki, and Yukio Satoh, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,239
Claims priority, application Japan, Dec. 25, 1981, 56-209032; Dec. 25, 1981, 56-209033
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—618 **1 Claim**



1. An optical communication apparatus comprising:

conversion means for converting an electric signal representing predetermined data to a visible light signal in order to transmit the predetermined data as the light signal;

transmission means comprising an optical fiber for transmitting the light signal from the conversion means to a terminal therethrough;

light guide means for guiding leaked light from the light signal from the conversion means, which leaked light is not transmitted through the transmission means;

window means for enabling visual monitoring of the state of operation of the conversion means by means of the leaked light guided by the light guide means; and

shield means for shielding the window means from the exterior so that exterior light entering through the light guide means does not have harmful influence on the light signal from the conversion means.

DESIGN PATENTS

GRANTED OCT. 22, 1985

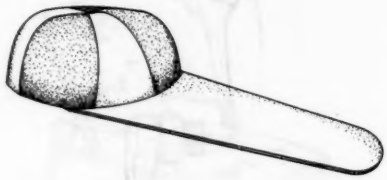
ERRATA

For CLASS	See PATENT NO.
D28–003	281,103
D28–035	281,105

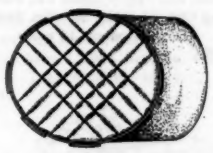
DESIGNS

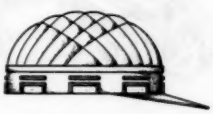
OCTOBER 22, 1985

281,030
HAT
Theodore L. Posthumus, 4273 Indian Spring Dr., Grandville, Mich. 49418
Filed May 9, 1983, Ser. No. 493,066
Term of patent 14 years
U.S. Cl. D2—244



281,031
BASEBALL CAP OR THE LIKE
Edward L. Gilligan, 2226 E. 50th Ave., Vancouver, British Columbia, Canada V5P 1V5
Filed Sep. 22, 1983, Ser. No. 534,611
Claims priority, application Canada, Jul. 13, 1983, 13-07-83-7
Term of patent 14 years
U.S. Cl. D2—244





281,032
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed May 10, 1983, Ser. No. 493,155
Term of patent 14 years
U.S. Cl. D2—320

281,033
CASE FOR A HEADPHONE
Akinari Mohri, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 26, 1982, Ser. No. 444,532
Claims priority, application Japan, Jun. 1, 1982, 57-24108
Term of patent 14 years
U.S. Cl. D3—30.1

281,034
LUGGAGE CASE
Bruce Weiner, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Sep. 2, 1983, Ser. No. 528,804
Term of patent 14 years
U.S. Cl. D3—48

281,035
BRUSH
Ronald Herzfeld, Kirchenstrasse 65, D-8034 Germering (BRD), Fed. Rep. of Germany
Filed Oct. 25, 1983, Ser. No. 545,301
Term of patent 14 years
U.S. Cl. D4—102

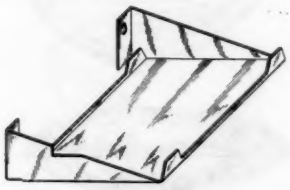
281,036
UNIFORM ACCESSORY HANGER OR SIMILAR ARTICLE
Quentin E. Martin, Jr., 7157H Melia Ct., Honolulu, Hi. 96818
Filed Oct. 24, 1983, Ser. No. 544,564
Term of patent 14 years
U.S. Cl. D6—315

281,037
CHAISE LOUNGE
Paul H. Parker, Poultney, Vt., assignor to The Telescope Folding Furniture, Inc., Granville, N.Y.
Filed Mar. 31, 1983, Ser. No. 480,748
Term of patent 14 years
U.S. Cl. D6—361

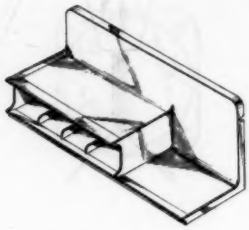
281,038
BUFFET
Robert K. Thorpe, Laguna Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed May 9, 1983, Ser. No. 492,540
Term of patent 14 years
U.S. Cl. D6—445

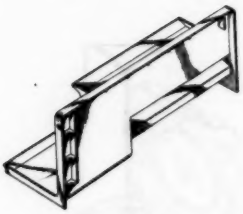
281,039
STAND
Fred J. Hurst, 215 Hilltop Dr., Paso Robles, Calif. 93446
Filed Dec. 23, 1982, Ser. No. 452,704
Term of patent 14 years
U.S. Cl. D6—486

281,040
SHELF
William J. Campbell, and Gerard Diaz, both of Valhalla, N.Y., assignors to Technical Support Services, Inc., Valhalla, N.Y.
Filed Apr. 1, 1983, Ser. No. 481,256
Term of patent 14 years
U.S. Cl. D6—574

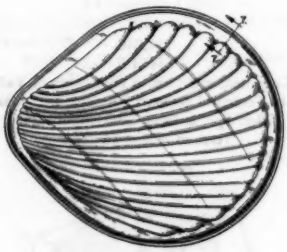


281,041
SHELF UNIT
Rudolf T. F. Plaut, Lisvane, Wales, assignor to Northmace Limited, Glamorgan, Wales
Filed Sep. 7, 1983, Ser. No. 530,036
Claims priority, application United Kingdom, Mar. 19, 1983, 1012065
Term of patent 14 years
U.S. Cl. D6—567





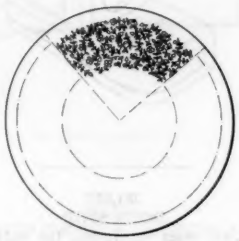
281,042
COVERED FOOD CONTAINER
Patricia A. Antoni, Wheeling, and Roger A. Kurinsky, Buffalo Grove, both of Ill., assignors to Ekco Products, Inc., Wheeling, Ill.
Filed Jan. 14, 1983, Ser. No. 458,062
Term of patent 14 years
U.S. Cl. D7—5



281,043
PLATE OR SIMILAR ARTICLE
Helen Zughaib, Jamesville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 22, 1983, Ser. No. 477,848
Term of patent 14 years
U.S. Cl. D7—23

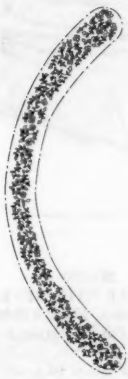
281,044
SAUCER
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,947
Term of patent 14 years
U.S. Cl. D7—30

281,045
PLATE OR SIMILAR ARTICLE
Simone Colquitt, Bronxville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,172
The portion of the term of this patent subsequent to Apr. 30, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—33

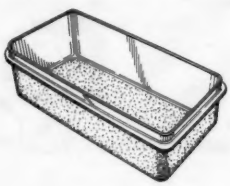


281,046
PLATE OR SIMILAR ARTICLE
Helen Zughaib, Jamesville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,084
Term of patent 14 years
U.S. Cl. D7—33

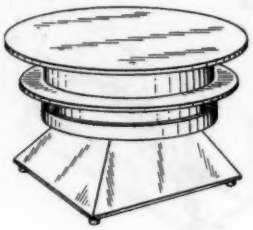
281,047
TRANSFER OR THE LIKE FOR CHINAWARE OR SIMILAR ARTICLES
Simone Colquitt, Bronxville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,170
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—39



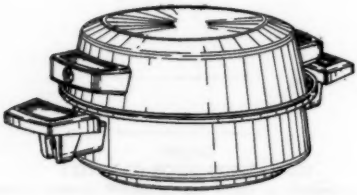
281,048
CONTAINER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 1, 1983, Ser. No. 462,825
Term of patent 14 years
U.S. Cl. D7—79



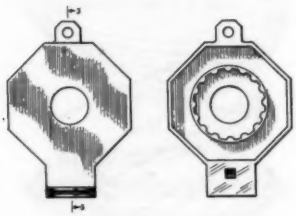
281,049
CAKE STAND
Allen E. Rau, Tacoma, Wash., assignor to Violet J. Towns and Joseph M. Towns, both of Everett, Wash.
Filed Jan. 24, 1983, Ser. No. 460,290
Term of patent 14 years
U.S. Cl. D7—83



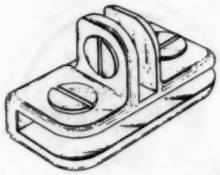
281,050
COMBINED CASSEROLE WITH REVERSIBLE COVER
William C. Cesaroni, Glenview, Ill., and Robert P. Rauen, West Bend, Wis., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 8, 1983, Ser. No. 473,296
Term of patent 14 years
U.S. Cl. D7—360



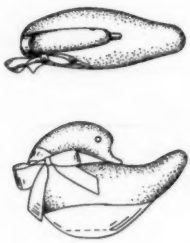
281,051
COMBINED BOTTLE AND TAB CAN OPENER
Fred Nielsen, P.O. Box 9051, San Diego, Calif. 92109
Division of Ser. No. 334,090, Mar. 25, 1982, Pat. No. Des. 276,691. This application Dec. 6, 1984, Ser. No. 649,855
Term of patent 14 years
U.S. Cl. D8—40



281,052
SHEET GLASS CONNECTOR
Gary L. Farmer, Downey, and Donald E. Lender, Long Beach, both of Calif., assignors to Cal-Tuf Glass Corporation, South Gate, Calif.
Filed Dec. 8, 1985, Ser. No. 559,357
Term of patent 14 years
U.S. Cl. D8—394



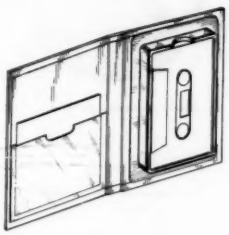
281,053
DOOR STOP
Lois A. Curry, 417 Main St., Hebron, Ind. 46341
Filed May 4, 1983, Ser. No. 491,423
Term of patent 14 years
U.S. Cl. D8—402



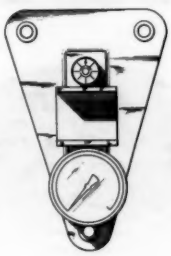
281,054
ATOMIZER
Kurt Menrad, Öhningen, Fed. Rep. of Germany, assignor to Pfeiffer Kinststofftechnik GmbH & Co. KG, Fed. Rep. of Germany
Filed Dec. 1, 1982, Ser. No. 445,903
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, MRI158R
Term of patent 14 years
U.S. Cl. D9—300

281,055
COLLAPSIBLE TUBE
Edward Dombroski, Sea Girt, N.J., assignor to Peerless Tube Company, Bloomfield, N.J.
Filed Feb. 1, 1983, Ser. No. 462,929
Term of patent 14 years
U.S. Cl. D9—302

281,056
BOOKLET WITH WEDDING CASSETTE AND CARD
Odette de La Tour, 16 W. 82nd St., New York, N.Y. 10024
Filed Jan. 17, 1983, Ser. No. 458,326
Term of patent 14 years
U.S. Cl. D9—337

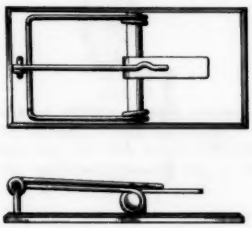


281,057
OVERHEAD DOOR WEIGHING SCALE
Richard C. Etchison, Rte. #6, Box 342, Anderson, Ind. 46011
Filed Apr. 25, 1983, Ser. No. 488,128
Term of patent 14 years
U.S. Cl. D10—91

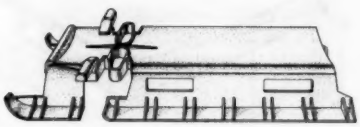


281,058
SCALE
Leona Gertler, 23-10A Cpl. Kennedy St., Bayside, N.Y. 11360
Filed May 6, 1983, Ser. No. 492,430
Term of patent 14 years
U.S. Cl. D10—92

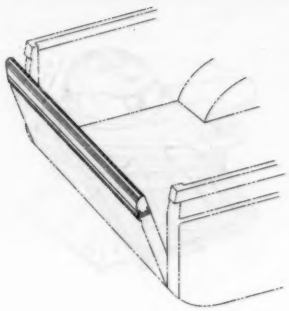
281,059
NOVELTY SCULPTURE
Daniel E. Levine, 4207 Argosy Ct., Madison, Wis. 53714
Filed May 4, 1983, Ser. No. 492,482
Term of patent 14 years
U.S. Cl. D11—157



281,060
SLED
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039, assignor to The Mel Appel Company, Short Hills, N.J.
Filed Nov. 2, 1983, Ser. No. 548,199
Term of patent 14 years
U.S. Cl. D12—10

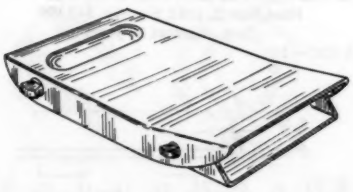


281,061
TAILGATE BUMPER
Richard J. Tortolani, 714 Centerville Rd., Warwick, R.I. 02886
Filed Feb. 28, 1983, Ser. No. 470,090
Term of patent 14 years
U.S. Cl. D12—167

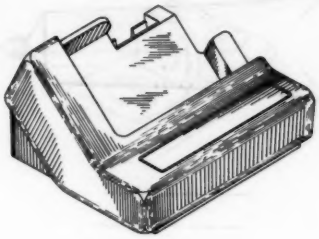


281,062
WHEEL
Stanley C. Hess, Chatsworth, Calif., assignor to B.M.X. Products, Inc., Moorpark, Calif.
Filed Sep. 2, 1982, Ser. No. 414,396
Term of patent 14 years
U.S. Cl. D12—169

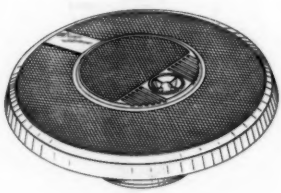
281,063
FOLDED WHEEL BLOCK
Merle M. De Raad, Burnsville, Minn., assignor to Bridge Wheel Company, Inc., Minneapolis, Minn.
Filed Oct. 20, 1983, Ser. No. 543,900
Term of patent 14 years
U.S. Cl. D12—217



281,064
DISPLAY PAGER RECEIVER SINGLE UNIT CHARGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 1, 1983, Ser. No. 499,974
Term of patent 14 years
U.S. Cl. D13—5

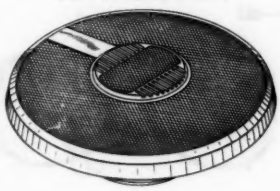


281,065
LOUDSPEAKER
Akira Katsuno, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan
Filed Jun. 13, 1983, Ser. No. 503,398
Claims priority, application Japan, Dec. 24, 1982, 57-58447
Term of patent 14 years
U.S. Cl. D14—30

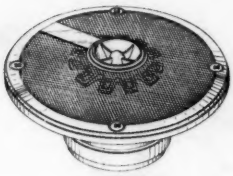


281,066
LOUD SPEAKER
Olle Humble, Täppstigen 4, Lidingö, and Olle Mirsch, Carl Krooks gata 9, Helsingborg, both of Sweden
Filed Oct. 6, 1982, Ser. No. 433,039
Claims priority, application Sweden, Apr. 6, 1982, 82-0904
Term of patent 14 years
U.S. Cl. D14—30

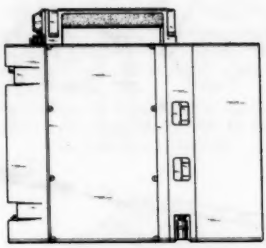
281,067
LOUDSPEAKER
Akira Katsuno, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 13, 1983, Ser. No. 503,399
Claims priority, application Japan, Dec. 24, 1982, 57-58448
Term of patent 14 years
U.S. Cl. D14—30

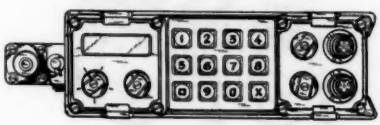


281,068
LOUDSPEAKER
Akira Katsuno, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan
Filed Jun. 13, 1983, Ser. No. 503,448
Claims priority, application Japan, Dec. 24, 1982, 57-58449
Term of patent 14 years
U.S. Cl. D14—30



281,069
RADIO
Leif E. I. Brunström, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed May 19, 1983, Ser. No. 496,203
Claims priority, application Sweden, Dec. 2, 1982, 82-2888
Term of patent 14 years
U.S. Cl. D14—70





281,070

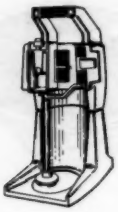
FLUID PUMP HOUSING

Rudolf R. Karliner, Minnetonka, Minn., and Douglas W. Smith, Belle Mead, N.J., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Dec. 14, 1982, Ser. No. 449,571

Term of patent 14 years

U.S. Cl. D15—7



281,071

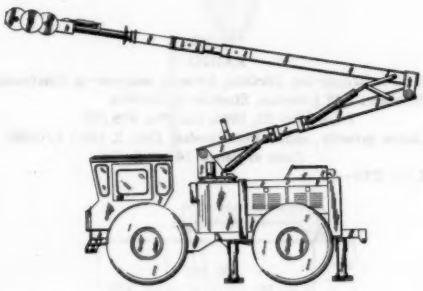
TREE TRIMMING MACHINE

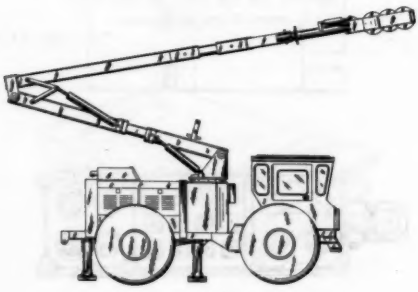
Philip C. McCray, Montgomery, Ala., assignor to Kershaw Manufacturing Company, Inc., Montgomery, Ala.

Filed Feb. 8, 1983, Ser. No. 464,906

Term of patent 14 years

U.S. Cl. D15—26





281,072

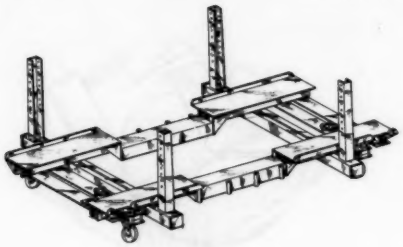
VEHICLE BODY STRAIGHTENING TILTABLE RACK

Thomas C. Hunt, R.R. 2, Box 147C, Rockville, Ind. 47872

Filed Sep. 7, 1982, Ser. No. 415,529

Term of patent 14 years

U.S. Cl. D15—199



281,073

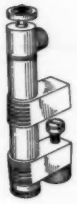
CLAMP AND TABLE STAND

Rudolph Hanke, Monheim, Fed. Rep. of Germany, assignor to Hama Hamaphot KG Hanke & Thomas, Monheim, Fed. Rep. of Germany

Division of Ser. No. 377,329, May 12, 1982, Pat. No. Des. 276,621. This application Oct. 12, 1984, Ser. No. 660,227

Term of patent 14 years

U.S. Cl. D16—45



281,074

EYEGLASSES

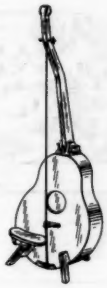
Barton M. Levoy, 130 Cutter Mill Rd., Great Neck, N.Y. 11022

Filed Jan. 9, 1984, Ser. No. 569,339

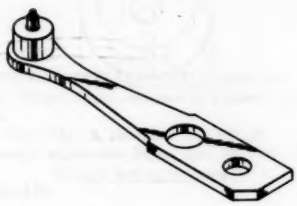
Term of patent 14 years

U.S. Cl. D16—102

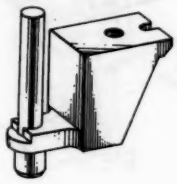
281,075
STRINGED MUSICAL INSTRUMENT
James R. Stolhand, P.O. Box 285, Odell, Oreg. 97044
Filed Jul. 13, 1983, Ser. No. 513,346
Term of patent 14 years
U.S. Cl. D17—19



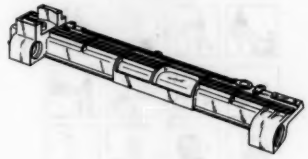
281,076
PRINTING HAMMER FOR DOT PRINTER
Toshio Kurihara, Tokorozawa; Makoto Yasunaga, Kawagoe; Masao Kunita; Seiichi Osawa, both of Sayama, and Takashi Moriya, Higashi-Murayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Apr. 13, 1983, Ser. No. 484,487
Claims priority, application Japan, Oct. 20, 1982, 57-47377
Term of patent 14 years
U.S. Cl. D18—22



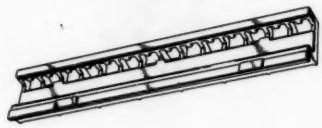
281,077
CORE BLOCK FOR PRINTING HEAD
Makoto Yasunaga, Kawagoe; Masao Kunita, Sayama; Katsuya Masuda, Tokyo, and Seiichi Osawa, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 11, 1983, Ser. No. 493,675
Claims priority, application Japan, Nov. 15, 1982, 57-51251
Term of patent 14 years
U.S. Cl. D18—22



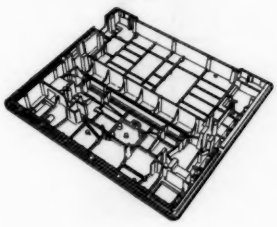
281,078
HOLDER FOR PRINTING HEAD FRAME
Ken Kozasa, Kawagoe; Michio Koizumi, and Yasuo Iwata, both of Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 20, 1983, Ser. No. 496,667
Claims priority, application Japan, Nov. 22, 1982, 57-52306
Term of patent 14 years
U.S. Cl. D18—22



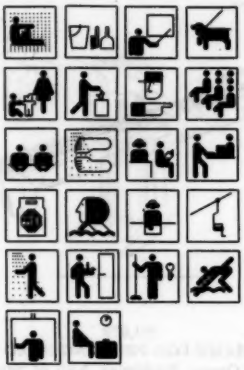
281,079
FRAME FOR PRINTING HEAD
Masao Kunita; Osamu Washimine, both of Sayama; Michio Koizumi, Tokorozawa; Yasuo Iwata, Tokorozawa, and Toshio Kurihara, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 11, 1983, Ser. No. 493,673
Claims priority, application Japan, Nov. 15, 1982, 57-51252
Term of patent 14 years
U.S. Cl. D18—23



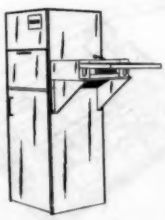
281,080
BASE FRAME FOR DOT PRINTER
Michio Koizumi, Tokorozawa; Osamu Washimine, Sayama; Ken Kozasa, Kawagoe; Seiichi Osawa, Sayama, and Takashi Moriya, Higashi-Murayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 11, 1983, Ser. No. 493,674
Claims priority, application Japan, Nov. 15, 1982, 57-51253
Term of patent 14 years
U.S. Cl. D18—23



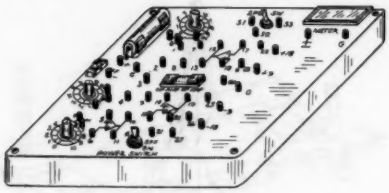
281,081
FONT OF SYMBOLS
Ruedi Zwissler, St. Jakobstrasse 87, and Els Maehr, Müller-Friedbergstrasse 28, both of 9000 St. Gallen, Switzerland
Filed Sep. 15, 1981, Ser. No. 302,409
Term of patent 14 years
U.S. Cl. D18—27



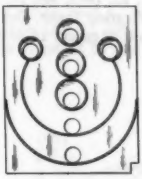
281,082
DOCUMENT SHREDDER
Ronald Lidman, Flottiljvägen 4 B, S-961 43 Boden, Sweden
Filed Jun. 24, 1983, Ser. No. 507,790
Claims priority, application Sweden, Dec. 29, 1982, 82-3113
Term of patent 14 years
U.S. Cl. D18—34



281,083
EDUCATIONAL ELECTRONIC EXPERIMENTATION LABORATORY
Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756
Filed Aug. 1, 1983, Ser. No. 519,138
Term of patent 14 years
U.S. Cl. D19—62

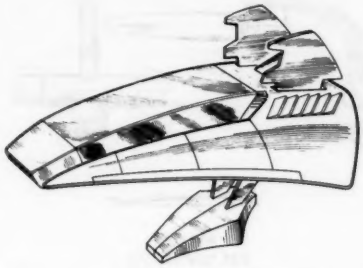


281,084
GAME TARGET
David A. Norton, Tampa, Fla., assignor to The Norton Co., Inc., Tampa, Fla.
Filed Dec. 2, 1982, Ser. No. 446,590
Term of patent 14 years
U.S. Cl. D21—5

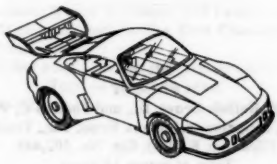


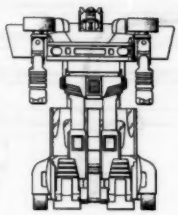
281,085
SLOT MACHINE
Richard E. Smyth, Blakehurst, Australia, assignor to Ainsworth Nominees Pty. Ltd., New South Wales, Australia
Filed Aug. 2, 1982, Ser. No. 404,033
Claims priority, application Australia, Jun. 23, 1982, 0767/82
Term of patent 14 years
U.S. Cl. D21—37

281,086
TOY SPACE VEHICLE
John J. Norton, and Michael Underhill, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 8, 1984, Ser. No. 578,253
Term of patent 14 years
U.S. Cl. D21—87

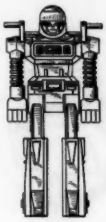


281,087
RECONFIGURABLE TOY VEHICLE
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1984, Ser. No. 587,355
Claims priority, application Japan, Jun. 15, 1983, 58-91863
Term of patent 14 years
U.S. Cl. D21—136



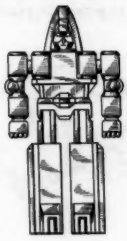


281,088
TOY ROBOT CONVERTIBLE INTO AUTOBIKE
Katsushi Murakami, Tokyo, Japan, assignor to Bandai Co., Ltd., Japan
Filed Sep. 16, 1982, Ser. No. 418,827
Term of patent 14 years
U.S. Cl. D21—150



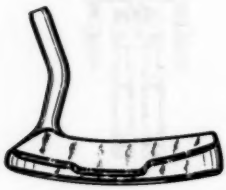
281,089
TOY ROBOT CONVERTIBLE INTO A HELICOPTER
Katsushi Murakami, Tokyo, Japan, assignor to Bandai Co., Ltd., Japan
Filed Sep. 16, 1982, Ser. No. 418,828
Term of patent 14 years
U.S. Cl. D21—150

281,090
TOY ROBOT CONVERTIBLE INTO AN AIRPLANE
Katsushi Murakami, Tokyo, Japan, assignor to Bandai Co., Ltd., Japan
Filed Sep. 16, 1982, Ser. No. 418,831
Term of patent 14 years
U.S. Cl. D21—150



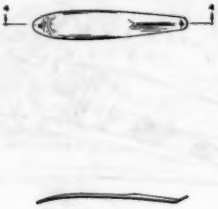
281,091
RAG DOLL
Sara S. Mays, 4795 Elmherst, Beaumont, Tex. 77706
Filed Aug. 19, 1982, Ser. No. 409,443
Term of patent 14 years
U.S. Cl. D21—181

281,092
GOLF PUTTER HEAD
Truett P. Mills, Tuscaloosa, Ala., assignor to Questor Corp., Tampa, Fla.
Filed Feb. 28, 1983, Ser. No. 470,077
Term of patent 14 years
U.S. Cl. D21—217

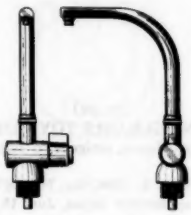


281,093
FISHING REEL
John G. Heimovics, Highland Park, Ill.; Richard J. Robbins, Derby, Kans.; Robert W. Fee, Ransom Canyon, Tex., and Shau-Min Liu, Wichita, Kans., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jun. 13, 1983, Ser. No. 501,781
Term of patent 14 years
U.S. Cl. D22—25

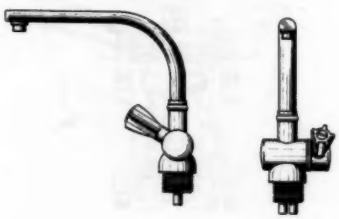
281,094
FISHING LURE
James V. Martino, 814 Westwood Trail, Webster, N.Y. 14580
Filed Jan. 26, 1983, Ser. No. 441,541
Term of patent 14 years
U.S. Cl. D22—29



281,095
FAUCET
Don C. Arnold, Buffalo Grove, Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Indiana Brass, Inc., Frankfort, Ind.
Filed Jun. 8, 1983, Ser. No. 502,443
Term of patent 14 years
U.S. Cl. D23—23



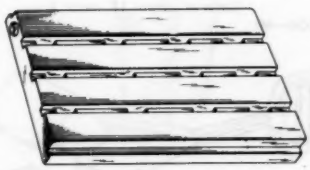
281,096
FAUCET
Don C. Arnold, Buffalo Grove, Ill., and Thomas C. Wilcox, East Troy, Wis., assignors to Indiana Brass, Inc., Frankfort, Ind.
Filed Jun. 8, 1983, Ser. No. 502,445
Term of patent 14 years
U.S. Cl. D23—23



281,097
FAUCET
Don C. Arnold, Buffalo Grove, Ill., and Thomas C. Wilcox, East Troy, Wis., assignors to Indiana Brass, Inc., Frankfort, Ind.
Filed Jun. 8, 1983, Ser. No. 502,444
Term of patent 14 years
U.S. Cl. D23—25

281,098
HYGIENIC JET
Wayne B. Jennings, P.O. Box 346, Gulf Shores, Ala. 36542
Filed Jun. 24, 1983, Ser. No. 507,599
Term of patent 14 years
U.S. Cl. D23—35

281,099
THERMOPLASTIC PANEL FOR STORING A THERMAL ENERGY STORAGE MATERIAL
James E. Kosinski; Wayne R. Hutter, and Paul J. Moses, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 13, 1983, Ser. No. 494,471
Term of patent 14 years
U.S. Cl. D23—72



281,100
PORTABLE ELECTRIC HEATER
E. Flückiger, Dietlikon, Switzerland, assignor to Robo Products Ltd., Switzerland
Filed Dec. 20, 1982, Ser. No. 451,560
Term of patent 14 years
U.S. Cl. D23—77

281,101
ROOM AIR CLEANER
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 6, 1983, Ser. No. 511,122
Term of patent 14 years
U.S. Cl. D23—149

281,102
AIR FRESHENER
William G. Bush, and Diane R. Iseman, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Oct. 27, 1983, Ser. No. 546,145
Term of patent 14 years
U.S. Cl. D23—150

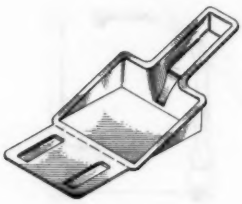
281,103
VITAMIN TABLET
Jim H. Martin, Huntington Beach, and Donnie R. Yancey, Tustin, both of Calif., assignors to Vita-Fresh Vitamin Company, Inc., Garden Grove, Calif.
Filed Nov. 2, 1983, Ser. No. 547,798
Term of patent 14 years
U.S. Cl. D28—3

281,104
SERRATED SURGICAL SCISSORS
John A. Davison, Sandy, Utah, assignor to Adler Instrument Company, Atlanta, Ga.
Filed Sep. 27, 1982, Ser. No. 423,987
Term of patent 14 years
U.S. Cl. D24—27

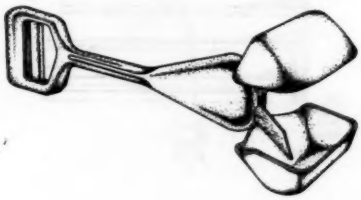
281,105
HEATED HAIR BRUSH
James M. Rittenhouse, Watchung, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,643
Term of patent 14 years
U.S. Cl. D28—35

281,106
SCAFFOLD PLANK
Norman I. Thomas, and Gunther Ilgoutz, both of Victoria, Australia, assignors to Chadwick Management Services Pty. Limited, New South Wales, Australia
Filed Jun. 9, 1982, Ser. No. 386,592
Claims priority, application Australia, Dec. 9, 1981, 86019
Term of patent 14 years
U.S. Cl. D25—68

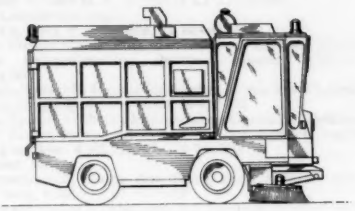
281,107
COMBINED LITTER SCOOP AND SCRAPER
Peter F. Lordi, Highland, N.Y., assignor to Ulster Manufacturing, Inc., Highland, N.Y.
Filed Mar. 14, 1983, Ser. No. 475,023
Term of patent 14 years
U.S. Cl. D30—99



281,108
PICKUP UNIT FOR ANIMAL DROPPINGS
Loren Wilson, 1430 Phillips St., Vista, Calif. 92083
Filed Dec. 19, 1983, Ser. No. 563,238
Term of patent 14 years
U.S. Cl. D30—99



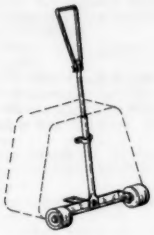
281,109
STREET SWEEPER
K. W. M. van Raaij, c/o Ravo B.V., Pettermerstraat 15-23, 1823 CW Alkmaar, Netherlands
Filed Apr. 27, 1983, Ser. No. 489,069
Term of patent 14 years
U.S. Cl. D32—16



281,110
TRASH RECEPTACLE
Jean-Michel Brossier, 2035 Pelham Ave., Los Angeles, Calif. 90025
Filed Jan. 20, 1983, Ser. No. 459,514
Term of patent 14 years
U.S. Cl. D34—4

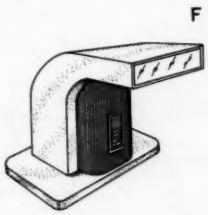
281,111
SWING TOP SELF-CLOSING WASTE RECEPTACLE
Donald R. McClelland, Vancouver, Wash., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 13, 1983, Ser. No. 494,273
Term of patent 14 years
U.S. Cl. D34—8

281,112
CART FOR A BOWLING BALL BAG
Henry L. Nichols, 301 E. Wildwood Ave., Fort Wayne, Ind. 46806
Filed Sep. 8, 1983, Ser. No. 530,414
Term of patent 14 years
U.S. Cl. D34—24



281,113
JACK-TYPE HOIST FOR HOISTING OF LOGS
N. Earl Plumb, Rte. 4, Ava, Mo. 65608
Filed May 12, 1983, Ser. No. 494,002
Term of patent 14 years
U.S. Cl. D34—31

281,114
AUTOMATIC TELLER STATION
John C. Cooke, Lebanon, Ohio, assignor to Kleski & Associates, Inc. and The Third National Bank and Trust Company, both of Dayton, Ohio
Filed Jan. 17, 1983, Ser. No. 458,682
Term of patent 14 years
U.S. Cl. D99—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A W Squier Limited: *See—*
Squier, William H. R., 4,548,275, Cl. 171-14.000.

Abbott Laboratories: *See—*
Larkin, Mark E., 4,548,606, Cl. 604-414.000.

Aberson, Gerard M.; and Ring, Gerard J. F., to Kimberly-Clark Corporation. Delayed-swelling absorbent systems. 4,548,847, Cl. 428-74.000.

Abplanalp, Robert H. Method for the mass production of a gasket-bearing mounting cup. 4,547,948, Cl. 29-417.000.

Abrams, Stanton, to Shelley Manufacturing Company, Division of Alco Food Service Equipment Company. Food products washing and drying machine. 4,548,221, Cl. 134-141.000.

Abt, Franz: *See—*
Staudenrausch, Georg; Abt, Franz; Kern, Manfred; and Zinser, Georg, 4,547,931, Cl. 17-1.00F.

Ace, Ronald, to Ace Sophisticates, Inc. Spectrophotometer for measuring absorption characteristics of a complex lens. 4,549,081, Cl. 250-372.000.

Ace Sophisticates, Inc.: *See—*
Ace, Ronald, 4,549,081, Cl. 250-372.000.

Ackley, Mark W.; and Szafranski, Brian D., to Figgie International Inc. Particulate air filter assembly. 4,548,626, Cl. 55-316.000.

Ackrell, Jack: *See—*
Muchowski, Joseph M.; Greenhouse, Robert; Ackrell, Jack; Li, Tsung-Tee; and Pfister, Jurg R., 4,548,949, Cl. 514-422.000.
Muchowski, Joseph M.; and Ackrell, Jack, 4,548,951, Cl. 514-522.000.

Adams, Charles T.: *See—*
Thompson, Mark S.; and Adams, Charles T., 4,548,920, Cl. 502-219.000.

Adams, Robert D. Brush uprooting attachment. 4,547,984, Cl. 37-2.00R.

Adebahr, Klaus, to Hauni-Werke Korber & Co. KG. Method and machine for making continuous cigarette rods and the like. 4,548,215, Cl. 131-84.400.

Adell, Robert, to U.S. Product Development Company. Metal and plastic edge guard. 4,547,994, Cl. 49-462.000.

Adir: *See—*
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Boulanger, Michelle, 4,548,820, Cl. 514-255.000.

Adolph Coors Company: *See—*
Bader, James S.; and Dugan, Larry M., 4,548,021, Cl. 53-398.000.

AEG-Elotherm: *See—*
Matthes, Hans G.; and Wittenbecher, Hasso, 4,549,256, Cl. 363-39.000.

AEL Microtel Limited: *See—*
Tin, Kam B., 4,549,273, Cl. 364-200.000.

Aeroquip Corporation: *See—*
Haubert, Steven D.; and Indrelunas, Stephen T., 4,548,430, Cl. 285-256.000.

Aerovox Incorporated: *See—*
MacDougall, Frederick W., 4,549,257, Cl. 363-61.000.

Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Light modulating apparatus. 4,548,477, Cl. 350-358.000.

Agee, John M. Fracture splint. 4,548,199, Cl. 128-92.00A.

Agency of Industrial Science and Technology: *See—*
Mitsuhashi, Yoshinobu; and Shimada, Junichi, 4,549,300, Cl. 372-50.000.
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,548,044, Cl. 62-48.000.

AGFA-Gevaert Aktiengesellschaft: *See—*
Heider, Alfred; Schlick, Erich; and Schnall, Gunther, 4,548,399, Cl. 271-221.000.
Helling, Gunter; and Himmelmann, Wolfgang, 4,548,887, Cl. 430-213.000.

Agfa-Gevaert N.V.: *See—*
Nelen, Petrus P., 4,548,396, Cl. 271-90.000.

Ahern, Ronald A., to Molins Limited. Cigarette manufacture. 4,548,216, Cl. 131-94.000.

Aida, Seiichi: *See—*
Ito, Yasuro; Higuchi, Yoshiro; and Aida, Seiichi, 4,547,975, Cl. 34-8.000.

Aigrefeuille, Charles V. Y., to Societe Francaise d'Orthopodie. Mold for forming orthopedic soles and plantar moldings adapted to the feet of patients. 4,548,563, Cl. 425-2.000.

Air Preheater Company, Inc., The: *See—*
Case, Michael A.; Mattison, Glenn D.; and Counterman, Wayne S., 4,548,261, Cl. 165-82.000.

Airflow Research and Manufacturing Corp.: *See—*
Gray, Leslie M., III, 4,548,548, Cl. 416-189.000.

Aisin-Warner K. K.: *See—*
Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,548,099, Cl. 74-689.000.

Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, to Toyota Jidosha Kabushiki Kaisha. Transmission mechanism with parallel transmission systems including torque converter in the first speed one only. 4,548,101, Cl. 74-720.000.

Akesson, Torsten. Water closet system having a liquid separator. 4,547,917, Cl. 4-300.000.

Akiba, Juji; Kobayashi, Satoru; and Sugibuchi, Hiroyuki, to Junkosha Company Ltd. Floating oil leak detector. 4,549,171, Cl. 340-605.000.

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Akieda, Shigeru: *See—*
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American Cyanamid Company: *See—*
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Stachura, Victor J., 4,548,260, Cl. 165-78.000.

American Specialty & Supply, Inc.: *See—*
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American Standard Inc.: *See—*
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Amoco Corporation: *See—*
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AMP Incorporated: *See—*
Derr, Paul B., 4,548,457, Cl. 339-88.00R.
John, Heinrich R.; and Munk, Ulrich B., 4,548,461, Cl. 339-217.00R.
Mosser, III: Benjamin H., 4,548,459, Cl. 339-97.00P.
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Anderson, Keith, to Tocco, Inc. Flux concentrator assembly for inductor. 4,549,057, Cl. 219-10.790.

Anderson, Richard W., to Ford Motor Company. Dual plug ignition system. 4,548,174, Cl. 123-310.000.

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Angott, Paul G. Ceiling fan control box. 4,548,554, Cl. 417-572.000.

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Anthony, Dennis R. Load-bearing rear-projection screen. 4,548,468, Cl. 350-117.000.

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Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,548,126, Cl. 92-213.000.

Asahi Glass Company Ltd.: *See—*
Nomaki, Koji; Mase, Hiroshi; Sato, Yasuo; and Iga, Motoichi, 4,548,636, Cl. 65-99.200.

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Avco Corporation: *See—*
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B. F. Goodrich Company, The: *See—*
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B.H. S.A.: *See—*
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B.I. Incorporated: *See*—
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Bacchio, Giovanni, to Fonderie Officine Riunite Ing. Graziano di L. Graziano & C.S.a.s. Drawing apparatus for textile fibre webs. 4,547,936, Cl. 19-258.000.
Badalamenti, Vito; and Weller, Nicholas J., to Kal Tool Engineering. Blow molding detabber. 4,548,574, Cl. 425-531.000.
Bader, James S.; and Dugan, Larry M., to Adolph Coors Company. Multiple container packaging system. 4,548,021, Cl. 53-398.000.
Badesha, Santokh S.; and Smith, Thomas W., to Xerox Corporation. Process for selenium purification. 4,548,800, Cl. 423-510.000.
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de Bruin, Henderikus J.; and Badwal, Sukhvinder P. S., 4,548,680, Cl. 204-1.00T.
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Bailey, Denis M., to Sterling Drug Inc. Benzyloxy or alkoxy substituted phenylaminobenzamides. 4,549,016, Cl. 544-165.000.
Bailey, John M., to Caterpillar Tractor Co. Ignition-assisted fuel combustion system. 4,548,172, Cl. 123-298.000.
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Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., to Imperial Chemical Industries PLC. Conducting polymers. 4,548,737, Cl. 252-500.000.
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Beier, Stefan, to Kaltenbach & Voigt GmbH & Co. Circuit arrangement for controlling the action of an adjusting device, in particular for a patient chair. 4,549,124, Cl. 318-663.000.
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Bell, David B. Voice/data digital, duplex link. 4,549,290, Cl. 370-32.000.
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Bendl, Peter, to Feodor Burgmann Dichtungswerke GmbH & Co. Articulated pipe joint seal assembly. 4,548,415, Cl. 277-100.000.
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Cowans, Kenneth W.; and Bennett, M. Owen, 4,549,146, Cl. 330-149.000.
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Berfield, Robert C., to Shop-Vac Corporation. Compact vacuum cleaner. 4,547,927, Cl. 15-327.00F.
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Knoblauch, Karl; Heimbach, Heinz; and Harder, Burkhard, 4,548,799, Cl. 423-351.000.
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Besson, Bernard; and Guernet, Jacques, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM). Hydromechanical transmission comprising a hydrokinetic coupler when necessary in particular for direction of tracked vehicles. 4,548,098, Cl. 74-687.000.
Best, Christopher H., to Lucas Industries Limited. Governor system. 4,548,177, Cl. 123-357.000.
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Carey, Martin C.; Moses, Alan C.; and Flier, Jeffrey S., 4,548,922, Cl. 514-4.000.
Betts, Bruce A., to TRW Inc. Corrosion resistant gray cast iron graphite flake alloys. 4,548,643, Cl. 75-124.000.
Beutier, Didier; Bruvier, Hugues; and Palvadeau, Claude, to Societe Miniere et Metallurgique de Penarroya. Electrochemical elimination of nickel from lead containing chloride solutions. 4,548,793, Cl. 423-92.000.
Biedka, Ryszard, to ITT Industries, Inc. Fibre fusion splicing. 4,548,630, Cl. 65-2.000.
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Mockesch, Erich; and Noack, Hans-Herbert, 4,548,321, Cl. 206-525.000.
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Swanson, Harley D.; McAninch, Terry L.; and Conner, J. Keith, 4,548,608, Cl. 8-94.160.
Bishop, Christopher J.; Cumner, Geoffrey M.; and Waters, John H., to Dowty Mining Equipment Limited. Roof support suitable for use in mines. 4,548,527, Cl. 405-294.000.
Bitar, Joseph. Rotary hydraulic machine with a multiplicity of axially aligned chambers. 4,548,561, Cl. 418-184.000.
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Blackborow, Malcolm H.; and Langley, Marlyn. Carrier for a windscreen wiper blade. 4,547,925, Cl. 15-250.420.
Blando, Jack, to Liverpool Industries, Inc. Building panel. 4,548,017, Cl. 52-814.000.
Bloomfield, John W., III. Glass bottom boat. 4,548,148, Cl. 114-66.000.
Bloomquist, George W., to FMC Corporation. Vehicle supported foldable service conduit. 4,548,236, Cl. 137-615.000.
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Cunningham, Roger D., 4,548,579, Cl. 432-72.000.
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Bluzer, Nathan, to Westinghouse Electric Corp. Heterojunction semiconductor device. 4,549,195, Cl. 357-30.000.
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Bocquet, Jacques; and Werguin, Jean C., to Union Siderurgique du Nord et de L'est de la France (USINOR). Cast cold rolling roll and its method of manufacture. 4,548,653, Cl. 148-3.000.
Bode, Albert; Chambers, Thomas V.; Hahnke, Manfred; and Kretzschmar, Wolfgang, to American Hoechst Corporation. Yellow disperse dyestuff mixtures and dyeing process. 4,548,613, Cl. 8-638.000.
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Bodine, Albert G. Apparatus and method for installing well casings in the ground employing resonant sonic energy in conjunction with hydraulic pulsating jet action. 4,548,281, Cl. 175-55.000.
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Voss, Gunther; and Gruber, Peter, 4,548,825, Cl. 426-383.000.
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Banholzer, Rolf, 4,549,021, Cl. 546-127.000.
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Barnes, John M.; Haley, Robert G.; and Trepus, George E., Jr., 4,548,861, Cl. 428-322.700.
Kline, William T.; and Mittelstadt, Robert F., 4,548,859, Cl. 428-251.000.
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Bogenschutz, Thomas M., to General Signal Corporation. Ball valve with improved vent structure. 4,548,237, Cl. 137-625.220.
Bohnenkamp, Heinrich, to SMS Schloemann-Siemag AG. Strip-rolling stand with built-in roll-cutters. 4,548,064, Cl. 72-236.000.
Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., to Honeywell Inc. Integral flow sensor and channel assembly. 4,548,078, Cl. 73-204.000.
Bokil, Delip R.; and Morong, William H., III, to Analog Devices, Incorporated. Method of manufacture of miniaturized transformer. 4,547,961, Cl. 29-602.00R.
Boles, Sol; and Smrek, Walter J., to Grumman Aerospace Corporation. Moving target ordnance control. 4,549,184, Cl. 343-11.00R.
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Zeller, Gregor; and Bonn, Helmut, 4,548,454, Cl. 339-3.00S.
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Lech, Thaddeus, Jr.; and Frantz, Robert A., 4,548,302, Cl. 192-106.200.
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Born, Raymond W. Rotor and screw elevator equipped with a fail-safe control system. 4,548,298, Cl. 187-25.000.

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Boshier, Geoffrey, to Avco Corporation. Gap measuring apparatus. 4,549,207, Cl. 358-107.000.
Bossart, Erwin, to Maschinenfabrik Benninger AG. Thread tensioning apparatus for warp creel. 4,548,369, Cl. 242-150.00R.
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Bouadma, Noureddine; Bouley, Jean-Claude; and Riou, Jean. Process for producing a semiconductor laser with several independent wavelengths and laser obtained by this process. 4,547,956, Cl. 29-569.00L.
Bouland, Maurice; Van Gurp, Wilhelmus A. J.; and Zwijsen, Wilhelmus A. J. M., to U.S. Philips Corporation. F.M. Demodulator with waveform correction circuit. 4,549,143, Cl. 329-126.000.
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Tacker, Willis A., Jr.; Bourland, Joe D.; Babbs, Charles F.; and Geddes, Leslie A., 4,548,203, Cl. 128-419.00D.
Bourne, William R., to Hartwell Corporation. Latch assembly channel. 4,548,435, Cl. 292-229.000.
Bournonville, Jean-Paul; and Dinh, Chan T., to Societe Francaise des Produits pour Catalyse Pro-Catalyse. Process for manufacturing a hydrocarbon conversion catalyst and catalyst prepared by said process. 4,548,918, Cl. 502-154.000.
Bowes, Emmerson; Farcasiu, Malvina; and Scott, Eric J. Y., to Mobil Oil Corporation. Hydrotreating petroleum heavy ends in aromatic solvents with dual pore size distribution alumina catalyst. 4,548,709, Cl. 208-213.000.
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., to SmithKline Beckman Corporation. Antibiotics produced by *Kibdelosporangium aridum* shearer. 4,548,974, Cl. 424-118.000.
Box, Theodor M., to Piper Industries of Texas, Inc. Heavy-duty full-depth beverage case. 4,548,320, Cl. 206-509.000.
Boyle, Daniel J., to Champion International Corporation. 3 Cell reclosable dispenser. 4,548,318, Cl. 206-621.000.
Brand, William W.: *See*—
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.
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Holmwood, Graham; Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Scheinpflug, Hans, 4,548,945, Cl. 514-383.000.
Brandon, Bernard; Bailly, Andre ; and Meunier, Francis, to Centre Technique des Industries; and Centre National de la Recherche Scientique. Thermodynamic apparatus for cooling and heating by adsorption on a solid adsorbent and process for using the same. 4,548,046, Cl. 62-79.000.
Brandt, Eckhard; and Schultz, Friedrich, to E.C.H. Will (GmbH & Co.). Method and apparatus for forming a stream of partly overlapping paper sheets. 4,548,404, Cl. 271-303.000.
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Braswell, William D.: *See*—
Cordova, Colleen W.; Mago, Brij M.; Turner, Garland L.; and Braswell, William D., 4,548,866, Cl. 428-398.000.
Braun, Helmut, to Luk Lamellen und Kupplungsbau GmbH. Clutch plate for use in friction clutches of motor vehicles and the like. 4,548,309, Cl. 192-106.200.
Brauning, Egon, to Protoned B.V. Clothes stand. 4,548,328, Cl. 211-205.000.
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corpooration. Silanes useful as anti-treeing additives. 4,548,865, Cl. 428-379.000.
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Breazeale, Robert D.: *See*—
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Brechlin, Alfred, to Hoechst Aktiengesellschaft. Process for using a flexible laminatable photosensitive layer in the production of a printed circuit. 4,548,885, Cl. 430-49.000.
Bregoli, Lawrence J., to United States of America, Energy. Integrated current collector and catalyst support. 4,548,876, Cl. 429-39.000.
Brehm, Gailon E.; and Lehmann, Randall E., to Texas Instruments Incorporated. Common-gate GaAs FET design for monolithic microwave integrated circuits. 4,549,197, Cl. 357-41.000.
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Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Mineral winning plough. 4,548,444, Cl. 299-34.000.
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Brewster, Albert L. Thread anvils for inside micrometer. 4,547,970, Cl. 33-167.000.
Brian, Dow V.; and Hawes, Samuel R., to Voicemail International, Inc. Digitized voice message storage system. 4,549,047, Cl. 179-18.00B.
Brian, Michael, to Rockwell International Corporation. Dynamic voltage reference apparatus for A/D converters. 4,549,165, Cl. 340-347.0CC.
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Bridger, Robert F., to Mobil Oil Corporation. Reducing low temperature haze formation of hydrodewaxed base stocks. 4,548,725, Cl. 252-56.00R.
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Briggs, Aubrey C., to Dravo Corporation. Tethered vehicle for moving bulk material. 4,548,315, Cl. 198-728.000.
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Carey, Martin C.; Moses, Alan C.; and Flier, Jeffrey S., 4,548,922, Cl. 514-4.000.
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Brist, Kenneth; and Klein, Robert D., to Lincoln Manufacturing Company, Inc. Proofing or heating cabinet. 4,549,072, Cl. 219-400.000.
British Nuclear Fuels plc: *See*—
Lauder, David R.; and Bailey, Alan, 4,548,312, Cl. 198-392.000.
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Haab, Alvin D., 4,548,293, Cl. 182-99.000.
Brosch, Fred C., to Brosch Products, Inc. Rotary cutter. 4,548,118, Cl. 83-522.000.
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Brothers, Luther C.; and Leimone, Michael R. Propulsion system. 4,548,042, Cl. 60-668.000.
Brown, Donald P., to United States of America, Energy. Combined cold compressor/ejector helium refrigerator. 4,548,053, Cl. 62-500.000.
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Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,549,007, Cl. 528-76.000.
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Brown, William F.: *See*—
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Bruder, Gerhard; and Pippinger, Horst, to Elba-Werk Maschinen-Gesellschaft mbH & Co. Mobile apparatus for mixing and loading concrete. 4,548,538, Cl. 414-332.000.
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Steinmann, Peter; Engel, Reinhard; Parstorfer, Richard; Brugger, Rudolf; and Jonke, Gerhard, 4,548,669, Cl. 156-358.000.
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Slattery, Gordon C., 4,548,587, Cl. 440-86.000.
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Bryan, Henry H. Closure for a surface opening having an object passing therethrough and method of forming the closure. 4,548,853, Cl. 428-131.000.
Brygider, Sanford L. Gun cleaning implement. 4,547,924, Cl. 15-104.160.
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Buchman, Russell: *See*—
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Buchold, Henning: *See—*
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Buetemeister, Earl H.; and Colville, Larry L., to General Motors Corporation. Engine cranking motor lock out system. 4,549,089, Cl. 290-38.00R.

Buhler, Niklaus: *See—*
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Bunn, Christopher B., to DY-Core Systems Ireland Limited. Extrusion machine. 4,548,565, Cl. 425-64.000.

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Burns, Terry A.: *See—*
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Burr, Peter S.: *See—*
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Isaman, David L.; Perloff, Ronald S.; and Tomlinson, Christopher J., 4,549,292, Cl. 370-89.000.
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Cacho, Jaime A. Game with slidable discs, goal pockets, and rail traps. 4,548,409, Cl. 273-126.00R.

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Seager, Richard H., 4,548,524, Cl. 401-187.000.

Calviello, Joseph A., to Eaton Corporation. Light sensitive detector. 4,549,194, Cl. 357-30.000.

Calvin, James W.: *See—*
Sheffield, Miller; Metcalfe, Robert S.; and Calvin, James W., 4,548,267, Cl. 166-268.000.

Camacho, David P.: *See—*
Camacho, Salvador L.; and Camacho, David P., 4,549,065, Cl. 219-121.0PM.

Camacho, Salvador L.; and Camacho, David P., to Technology Application Services Corporation. Plasma generator and method. 4,549,065, Cl. 219-121.0PM.

Cambridge Filter Corp.: *See—*
Gualtieri, Peter J.; and Goulet, Roger T., 4,548,068, Cl. 73-40.700.

Cameron, Timothy B.: *See—*
Duncan, Don P.; and Cameron, Timothy B., 4,548,746, Cl. 260-104.000.

Campbell, George T. Locking device for vending machines. 4,548,060, Cl. 70-91.000.

Campbell, Roy: *See—*
Reynolds, Desmond H. J.; Price, Anthony G.; and Campbell, Roy, 4,547,967, Cl. 303-7.000.

Campbell, Simon F.: *See—*
Alker, David; Cross, Peter E.; and Campbell, Simon F., 4,548,935, Cl. 514-230.000.

Campolmi, Stefano: *See—*
Dalcanale, Enrico; Bottaccio, Giorgio; Campolmi, Stefano; and Montanari, Fernando, 4,549,025, Cl. 546-327.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
McAndless, John M., 4,548,072, Cl. 73-159.000.

Canivet, Jean-Luc, to Les Cables de Lyon. Method of injecting a viscous filler material into fiber-receiving grooves in the core of an optical fiber cable. 4,548,664, Cl. 156-166.000.

Cann, Gordon L. Spacecraft optimized arc rocket. 4,548,033, Cl. 60-203.100.

Canon Kabushiki Kaisha: *See—*
Fujiki, Makoto; and Takayama, Makoto, 4,549,236, Cl. 360-19.100.
Kaneko, Syuzo, 4,548,476, Cl. 350-350.00S.
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, 4,548,886, Cl. 430-70.000.
Masuda, Shunichi; and Satoh, Yukio, 4,549,314, Cl. 455-618.000.
Nagata, Toru, 4,548,304, Cl. 192-46.000.
Sue, Yasuhiko; Ariga, Masao; Tamura, Yasuyuki; Nagashima, Nao; Miyagi, Ken; Nakaoka, Masaki; and Suda, Masashi, 4,549,219, Cl. 358-257.000.
Yoshikawa, Masao, 4,548,489, Cl. 355-3.0DD.

Capital Controls Company, Inc.: *See—*
Kriebel, John E.; and Jones, Walton B., 4,548,359, Cl. 239-434.000.

Capo, James L.; and Cunningham, William D., to International Paper Company; and Hardee's Food Systems, Inc. Pop-out carton. 4,548,352, Cl. 229-17.00G.

Carey, Martin C.; Moses, Alan C.; and Flier, Jeffrey S., to Beth Israel Hospital; and Brigham & Women's Hospital, Inc., The. Drug administration. 4,548,922, Cl. 514-4.000.

Cargill, Incorporated: *See—*
Ireland, Donald T., 4,548,614. Cl. 23-300.000.

Carl Freudenberg, Firma: *See—*
Sakai, Katsuhide; and Matsui, Noboru, 4,548,860, Cl. 428-290.000.

Carl Schmale GmbH & Co. KG: *See—*
Freermann, Johannes, 4,548,141, Cl. 112-113.000.

Carlson, Peter S.: *See—*
Christianson, Michael L.; Warnick, Debra A.; and Carlson, Peter S., 4,548,901, Cl. 435-241.000.

Carranza, Fermin A., Jr.: *See—*
Newman, Michael G.; and Carranza, Fermin A., Jr., 4,548,219, Cl. 132-91.000.

Carrier Corporation: *See—*
Drucker, Alan S., 4,548,050, Cl. 62-291.000.
Greever, James E.; and Gray, Kenneth P., 4,547,952, Cl. 29-451.000.

Carroll, Gary T.; and Hunter, Robert D., to B.I. Incorporated. Time and accounting system. 4,549,264, Cl. 364-406.000.

Casas, Antonio V., to Prodes, S.A. 2-[(2,6-Dichlorophenyl)amino]-phenylacetoxyacetyl derivatives and therapeutic compositions containing same. 4,548,952, Cl. 514-533.000.

Case, Michael A.; Mattison, Glenn D.; and Counterman, Wayne S., to Air Preheater Company, Inc., The. Plurality of tubular heat exchanger modules. 4,548,261, Cl. 165-82.000.

Cashin Systems Corporation: *See—*
Dennis, Edmund G., 4,548,108, Cl. 83-27.000.

Cassellius, Jerome J.: *See—*
Phillips, James E.; and Cassellius, Jerome J., 4,548,213, Cl. 130-24.000.

Cassidy, Stephen: *See—*
Wevers, Jean; Ernst, Hubert; Cassidy, Stephen; and Barrat, Christian R., 4,548,757, Cl. 260-502.50E.

Castel, Rene; Dalboussiere, Gerard; and Kulakowski, Michel, to International Business Machines Corp. Device for reporting error conditions occurring in adapters, to the data processing equipment central control unit. 4,549,296, Cl. 371-16.000.

Castelein, Jean, to Montefina S.A. Polymeric material consisting of a mixture of high-impact polystyrene, high-density polyethylene and a styrene/diene block copolymer. 4,548,988, Cl. 525-71.000.

Castleman, Lawrence D. Intraocular posterior chamber lens. 4,547,914, Cl. 623-6.000.

Castleman, Lawrence D., to Roszkowski, Margaret L. Intraocular posterior chamber lens. 4,547,915, Cl. 623-6.000.

Castro, Horacio: *See—*
Castro, Marcelo; and Castro, Horacio, 4,549,045, Cl. 179-6.030.

Castro, Marcelo; and Castro, Horacio. Method to operate through a telephone line one automatic phone answering equipment specified among a plurality, and apparatus to carry it out. 4,549,045, Cl. 179-6.030.

Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,548,172, Cl. 123-298.000.

Cato, Robert T.; Dickson, LeRoy D.; and Stokes, Olen L., Jr., to International Business Machines Corporation. Holographic scanner control based on monitored diffraction efficiency. 4,548,463, Cl. 350-3.710.

Cebulak, Walter S.: *See—*
Ramser, Robert A.; Booz, A. David; Barch, Daniel R.; and Cebulak, Walter S., 4,548,768, Cl. 264-12.000.

Central Institute for the Deaf: *See—*
Engebretson, A. Maynard; Morley, Robert E., Jr.; and Popelka, Gerald R., 4,548,082, Cl. 73-585.000.

Centre National de la Recherche Scientique: *See—*
Brandon, Bernard; Bailly, Andre ; and Meunier, Francis, 4,548,046, Cl. 62-79.000.

Centre Technique des Industries: *See—*
Brandon, Bernard; Bailly, Andre ; and Meunier, Francis, 4,548,046, Cl. 62-79.000.

Century Boat Company: *See—*
Hegg, Allan B.; and Phares, James S., 4,548,155, Cl. 114-362.000.

Cereda, Enzo: *See—*
Biefti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.

Cermetek Microelectronics, Inc.: *See—*
Durham, Stephen J., 4,549,044, Cl. 179-5.00R.

Chakrabarti, Paritosh M.: *See*—
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,549,007, Cl. 528-76.000.

Chambers, Thomas V.: *See*—
Bode, Albert; Chambers, Thomas V.; Hahnke, Manfred; and Kretzschmar, Wolfgang, 4,548,613, Cl. 8-638.000.

Champion International Corporation: *See*—
Boyle, Daniel J., 4,548,318, Cl. 206-621.000.
Rekow, Vernon C., 4,548,323, Cl. 206-611.000.

Chan, Albert Y., to North American Philips Corporation. Apparatus for enhancing the playback signal in an optical data recording system. 4,549,288, Cl. 369-48.000.

Chandra, Suresh, to United States of America, Army. Ultra-high sensitivity interferometer. 4,548,502, Cl. 356-358.000.

Chang, Wen-Hsuan; and Ambrose, Ronald R., to PPG Industries, Inc. Thermosetting high solids solvent-based polyester-urethane coating composition and a method of preparing same. 4,548,998, Cl. 525-441.000.

Chapman, John M.; and Antonis, Basil, to Thorn EMI plc. Discharge lamps. 4,549,251, Cl. 362-216.000.

Charlebois, Leonard J.; and Anderson, James E., to Northern Telecom Limited. Telecommunications cable splice closures. 4,549,039, Cl. 174-72.00R.

Chastain, Lemuel J. Space frame construction with mutually dependent surfaces. 4,548,004, Cl. 52-81.000.

Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, to Rhone-Poulenc Specialites Chimiques. Water soluble gum/polymer compositions and hydrosols prepared therefrom. 4,548,734, Cl. 252-311.000.

Chavkin, Leonard. Long-acting anhydrous antiperspirant compositions containing triacetin. 4,548,808, Cl. 424-47.000.

Chazan, David; and Katila, Michael J., to Raychem Corporation. Method of providing a protective covering over a substrate. 4,548,662, Cl. 156-86.000.

Chembakaffery, George M.: *See*—
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,548,241, Cl. 140-89.000.

Chemical Bank: *See*—
Hough, Leslie; Phadnis, Shashikant P.; Khan, Riaz A.; and Jenner, Michael R., 4,549,013, Cl. 536-122.000.

Chen, Keming J.: *See*—
Norley, Ronald R.; Sendelweck, Gene K.; and Chen, Keming J., 4,549,218, Cl. 358-243.000.

Chen, Nai Y.; and Koenig, Leonard R., to Mobil Oil Corporation. Conversion of carbohydrates. 4,549,031, Cl. 585-408.000.

Chen, Yun-Tsu: *See*—
Fung, Paul S. T.; and Chen, Yun-Tsu, 4,548,809, Cl. 424-52.000.

Chesters, David A., to British Petroleum Company. Flame stabilizer. 4,548,576, Cl. 431-202.000.

Chevron Research Company: *See*—
Elson, Thomas D.; and Millhone, Ralph S., 4,548,269, Cl. 166-276.000.
Erdman, Timothy R., 4,548,722, Cl. 252-33.000.
Shippey, Michael A., 4,548,723, Cl. 252-39.000.

Chisso Corporation: *See*—
Sugimori, Shigeru; and Kojima, Tetsuhiko, 4,548,731, Cl. 252-299.630.

Chiu, Chen-hwa, to Exxon Production Research Co. Process for the liquefaction of natural gas. 4,548,629, Cl. 62-17.000.

Chiyoda, Kiyomu: *See*—
Suzuki, Etsuji; Uno, Shinichi; Chiyoda, Kiyomu; and Douji, Ryuhachirou, 4,549,206, Cl. 358-106.000.

Chorkey, William J. Directional control valve with straight through flow. 4,548,238, Cl. 137-625.250.

Choy, Edmund M.; and Baran, Mark E., to Westvaco Corporation. Foaming agent. 4,548,649, Cl. 106-213.000.

Chrisman, Timothy L.: *See*—
Hevoyan, Varoujan H., 4,548,157, Cl. 116-308.000.

Christensen, Thorkild: *See*—
Thomsen, Svend E.; and Christensen, Thorkild, 4,548,035, Cl. 60-384.000.

Christian, J. Robert; and Poli, Louis C., to United States of America, Army. Time division multiple access communications system. 4,549,293, Cl. 370-95.000.

Christian, Loeillet: *See*—
Michel, Diaz; and Christian, Loeillet, 4,548,422, Cl. 280-281.00R.

Christiansen, David W.; Brown, William F.; and Steffen, Jim M., to United States of America, Energy. Automated fuel pin loading system. 4,548,347, Cl. 228-48.000.

Christianson, Michael L.; Warnick, Debra A.; and Carlson, Peter S., to Zoecon Corporation. Plantlet generation by cell culture. 4,548,901, Cl. 435-241.000.

Chrysler Corporation: *See*—
Kissel, William R., 4,549,254, Cl. 363-21.000.

Chu, Chin-Chiun, to Mobil Oil Corporation. Zeolite catalysts of improved activity and para-selectivity. 4,548,914, Cl. 502-85.000.

Chugai Ro Kogyo Co., Ltd.: *See*—
Terasaka, Yoshiyasu; Tanabe, Masao; and Hori, Masanori, 4,549,079, Cl. 250-339.000.

Chulay, Steven J.: *See*—
Sutton, John H., III; and Chulay, Steven J., 4,548,596, Cl. 494-20.000.

Chung, Randall M.; and Rossean, Larry D., to Western Digital Corporation. Chip topography for a MOS disk memory controller circuit. 4,549,262, Cl. 364-200.000.

Ciba-Geigy AG: *See*—
Howell, Frederick H., 4,549,015, Cl. 544-87.000.

Ciba Geigy Corporation: *See*—
Hartmann, Albert; Wacker, Oskar; Baschang, Gerhard; and Tarcsay, Lajos, 4,548,923, Cl. 514-8.000.
Irving, Edward; and Smith, Terence J., 4,548,895, Cl. 430-325.000.
Jaffe, Edward E., 4,548,968, Cl. 524-88.000.
Martin, Henry, 4,548,756, Cl. 260-465.00E.
Mueller, Karl F.; and Heiber, Sonia J., 4,548,990, Cl. 525-123.000.
Preiswerk, Werner; and Bruttel, Beat, 4,548,610, Cl. 8-101.000.
Renner, Alfred; Grutter, Peter; and Hugi, Rolf, 4,549,008, Cl. 528-220.000.
Riediker, Martin; Rohde, Ottmar; Roth, Martin; and Buhler, Niklaus, 4,548,891, Cl. 430-283.000.

CIC Int'l. Corp.: *See*—
Levine, Morris M., 4,548,054, Cl. 62-342.000.

Ciekurs, Richard, to United States of America, Army. Externally powered separate loaded ammunition cannon. 4,548,120, Cl. 89-11.000.

Cii Honeywell Bull (Societe Anonyme): *See*—
Saada, Charles; and Mollier, Jean, 4,549,075, Cl. 235-380.000.

Cincinnati Milacron Inc.: *See*—
Kimmelaar, Rudolf J. A.; and Smits, Cornelis A., 4,547,997, Cl. 51-168.000.

Cini, Carlo: *See*—
Stefani, Fabrizio; Cini, Carlo; and Diazzi, Claudio, 4,549,095, Cl. 307-254.000.

Clairson International Corporation: *See*—
Kilkelly, John, 4,548,327, Cl. 211-187.000.

Clark, Earl, Jr.; and Irvin, Howard B., to Phillips Petroleum Company. Drilling fluids. 4,548,982, Cl. 524-556.000.

Clark, Jack P.: *See*—
Richardson, David L.; Patterson, Peter M.; Clark, Jack P.; Stanton, Scott R.; and Perry, Richard W., 4,548,785, Cl. 376-249.000.

Clark, John O.: *See*—
Legler, John G.; Bartlett, Robert L.; Haas, Charles J.; Woods, Garry W.; and Clark, John O., 4,548,246, Cl. 144-1.00C.

Clark, Norman R., to Bally Manufacturing Corporation. Bonus ball pinball game. 4,548,408, Cl. 273-121.00A.

Clark, Richard E.: *See*—
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,549,066, Cl. 219-121.0LG.

Clarks Limited: *See*—
Radford, Alfred D., 4,547,978, Cl. 36-3.00B.

Clecim: *See*—
Motte, Jean-Pierre; and Maurer, Ghislain, 4,549,301, Cl. 373-108.000.

Clements, Jack D., to Solo Cup Company. Disposable cup assembly. 4,548,348, Cl. 229-1.50H.

Cliber, James A.: *See*—
Mabie, Curtis P., Jr.; Busby, Robert L.; and Cliber, James A., 4,548,381, Cl. 249-114.00R.

Clif Mock Company: *See*—
Parrott, Kenneth S.; Gillis, Wendell K.; and Baros, Bernard C., 4,548,509, Cl. 366-349.000.

Clifford, Alfred: *See*—
Otting, Billy J.; and Clifford, Alfred, 4,547,921, Cl. 8-151.000.

Clisura, George L.: *See*—
Katz, Saul N.; Proscia, George E.; and Clisura, George L., 4,548,827, Cl. 426-427.000.

Cluff, Stephen L.; Strolle, Clifford H.; and Breazeale, Robert D., to Du Pont de Nemours, E. I., and Company. Internally crosslinkable acrylic polymers and diglycidyl esters of dibasic acids. 4,548,963, Cl. 523-427.000.

Clusener, Gerhard R. Multiple sensor dilatometer. 4,548,515, Cl. 374-56.000.

Coad, George: *See*—
Hutchinson, Martin A.; Shaw, R. Howard; and Coad, George, 4,548,699, Cl. 204-298.000.

Cobler, Larry L. Fence protector. 4,548,388, Cl. 256-32.000.

Cole, Terence G.; and West, Roderick M., to International Business Machines Corporation. Step waveform generator and CRT vertical timebase incorporating such a generator. 4,549,118, Cl. 315-393.000.

Cole, Theodore M., Jr. Security lock for double doors. 4,548,436, Cl. 292-292.000.

Coli, Giuseppe: *See*—
Fogaroli, Giuseppe; and Coli, Giuseppe, 4,549,222, Cl. 358-296.000.

Collins, David W.: *See*—
Axmear, Frederick E.; and Collins, David W., 4,549,232, Cl. 360-77.000.

Collins, Walter W., to Gerber Legendary Blades. Snap lock connector with push-button release. 4,547,937, Cl. 24-607.000.

Colliopoulos, John A.; Paul, David B.; and Young, James G., to G. D. Searle & Co. Psyllium hydrophilic mucilloid composition. 4,548,806, Cl. 424-35.000.

Colville, Larry L.: *See*—
Buetemeister, Earl H.; and Colville, Larry L., 4,549,089, Cl. 290-38.00R.

Comalco Aluminum Limited: *See*—
Andrews, William H.; Milne, David J.; Moyle, Ronald W.; and Peters, James P., 4,548,795, Cl. 423-126.000.

Combier, Michel, to Telecommunications Radioelectriques. Digital echo canceller. 4,549,048, Cl. 179-170.200.

Combustion Engineering, Inc.: *See*—
Palkes, Mark, 4,548,162, Cl. 122-7.00R.

Commissariat a l'Energie Atomique: *See*—
Al Mouhamed, Mayez, 4,549,261, Cl. 364-183.000.
Compagnie de Signaux et d'Enterprises Electriques: *See*—
Le Hong, Son; and Martin, Henri, 4,548,220, Cl. 133-3.00H.
Condrac, Edward J.: *See*—
Miller, Robert A.; and Condrac, Edward J., 4,548,040, Cl. 60-619.000.
Confloat Consulting Ltd.: *See*—
Watchorn, Ernest W., 4,548,153, Cl. 114-267.000.
Conner, J. Keith: *See*—
Swanson, Harley D.; McAninch, Terry L.; and Conner, J. Keith, 4,548,608, Cl. 8-94.160.
Connor, Daniel S. Ethoxylated amine oxides having clay soil removal-/anti-redeposition properties useful in detergent compositions. 4,548,744, Cl. 252-545.000.
Conoco Inc.: *See*—
Wolf, Nicholas O.; and Yang, Kang, 4,548,707, Cl. 208-188.000.
Consiglio Nazionale Delle Ricerche: *See*—
Guidelli, Rolando; and Foresti, Maria L., 4,548,679, Cl. 204-1.00T.
Continental Can Company, Inc.: *See*—
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,548,668, Cl. 156-357.000.
Continental Packaging Company, Inc.: *See*—
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,549,066, Cl. 219-121.0LG.
Contraves AG: *See*—
Heller, Rudolf; and Khan, Iwan, 4,547,949, Cl. 29-421.00E.
Conville, John J.: *See*—
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., 4,548,787, Cl. 422-15.000.
Cook, Incorporated: *See*—
Osborne, Thomas A., 4,548,206, Cl. 128-772.000.
Cook, Melvin S. Growth of lattice-graded epilayers. 4,548,658, Cl. 148-175.000.
Coombs, Daniel M.; and Latimer, Edward G., to Phillips Petroleum Company. Solvent extraction. 4,548,711, Cl. 208-309.000.
Cooper, Bruce H.: *See*—
Heater, Charles P.; and Cooper, Bruce H., 4,548,595, Cl. 493-458.000.
Cooper Industries, Inc.: *See*—
Ulijasz, Thaddeus R., 4,549,085, Cl. 250-551.000.
Cooper, Kenneth C.; and Pollard, William, to FOSECO International Ltd. Holding device for hot top lining slabs. 4,548,380, Cl. 249-106.000.
Copeland Corporation: *See*—
Prenger, Werner H., 4,548,234, Cl. 137-543.190.
Cordis Corporation: *See*—
Harris, Donald L., 4,548,607, Cl. 604-891.000.
Cordova, Colleen W.; Mago, Brij M.; Turner, Garland L.; and Braswell, William D., to Allied Corporation. High strength hollow filament yarn. 4,548,866, Cl. 428-398.000.
Corkins, H. Glenn: *See*—
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.
Cornell, Paul A., to Pan Electric Corporation. Cable clamping device. 4,548,462, Cl. 339-266.00R.
Corompt, Antoine, to Bennes Marrel. Method and apparatus for unloading a piece of equipment placed on a carrying vehicle. 4,548,541, Cl. 414-479.000.
Corrigan, Nigel M. Radio transmitting and receiving apparatus. 4,549,309, Cl. 455-78.000.
Corsetti, John A. Lamp socket attachment. 4,548,449, Cl. 339-154.00L.
Cosden Technology, Inc.: *See*—
Hahn, Granville J.; and Rutledge, Raleigh N., 4,548,570, Cl. 425-141.000.
Morris, Jeffrey D.; and Fuller, Robert A., 4,548,788, Cl. 422-109.000.
Schwarz, Richard A., 4,548,956, Cl. 521-56.000.
Councilman, Richard R., to Brunswick Corporation. Bait clicker for fishing reel. 4,548,367, Cl. 242-84.51R.
Counterman, Wayne S.: *See*—
Case, Michael A.; Mattison, Glenn D.; and Counterman, Wayne S., 4,548,261, Cl. 165-82.000.
Couto, Luis R.: *See*—
Bawa, Jaspal S.; Couto, Luis R.; Rapacki, Edward S.; Wood, Alfred; and Pobuta, Walter A., deceased, 4,549,037, Cl. 174-65.0SS.
Cowans, Kenneth W.; and Bennett, M. Owen. Systems and methods for compensating for element nonlinearities in electronic circuits. 4,549,146, Cl. 330-149.000.
Cox, Howard N., to General Electric Company. Tension control in a metal rolling mill. 4,548,063, Cl. 72-16.000.
Cox, J. David, to Hydro-Seal Valve Company, Inc. Method and apparatus for testing a relief valve. 4,548,067, Cl. 73-4.00R.
Crandell, William H.; Moren, John L.; and Ruona, Paul Q., to Dynatech Laboratories Incorporated. Disposable/reusable dispenser for dispensing contaminatable and noncontaminatable liquids. 4,548,245, Cl. 141-237.000.
Craven, Trevor. Universal trailer hitch. 4,548,423, Cl. 280-492.000.
Crawley, Michael W., to Eastman Kodak Company. Photographic products employing novel nondiffusible hydrazone dye-releasing compounds. 4,548,888, Cl. 430-223.000.
Creative Products Resource Associates, Ltd.: *See*—
Smith, James A.; and Murphy, Betty J., 4,548,954, Cl. 521-52.000.
Creed, David M.; and Ive, John G. S., to Sony Corporation. Detecting and correcting errors in digital audio signals. 4,549,298, Cl. 371-40.000.
Cross, Peter E.: *See*—
Alker, David; Cross, Peter E.; and Campbell, Simon F., 4,548,935, Cl. 514-230.000.
Crown Zellerbach Corporation: *See*—
Holland, Geoffrey J., 4,548,770, Cl. 264-22.000.
Wolthausen, Edward C., 4,548,081, Cl. 73-584.000.
Cukor, Peter: *See*—
Lee, Kang I.; Jensen, William; and Cukor, Peter, 4,548,893, Cl. 430-296.000.
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Dual compartment powder cartridge. 4,548,322, Cl. 206-526.000.
Cullen, Robert E.; Kurowski, Henry B.; and Sidwell, William S., to Du Pont de Nemours, E. I., and Company. Yarn texturing jet. 4,547,938, Cl. 28-254.000.
Cumner, Geoffrey M.: *See*—
Bishop, Christopher J.; Cumner, Geoffrey M.; and Waters, John H., 4,548,527, Cl. 405-294.000.
Cunningham, Robert A.: *See*—
Hall, James R.; and Cunningham, Robert A., 4,548,431, Cl. 285-334.000.
Cunningham, Roger D., to Blu-Surf, Inc. Compound reducing oven. 4,548,579, Cl. 432-72.000.
Cunningham, William D.: *See*—
Capo, James L.; and Cunningham, William D., 4,548,352, Cl. 229-17.00G.
Curry, John J. Child resistant/tamper resistant cap. 4,548,329, Cl. 215-216.000.
D G & Associates, Inc.: *See*—
Hero, Richard A., 4,547,990, Cl. 43-15.000.
Dahowski, Donald E., to Quaker Plastic Corporation. Concrete expansion joint. 4,548,009, Cl. 52-396.000.
Daikin Kogyo Co., Ltd.: *See*—
Suzuki, Takeshi; and Suzue, Seisuke, 4,548,986, Cl. 525-66.000.
Daimler-Benz Aktiengesellschaft: *See*—
Stolz, Albert; Volz, Wolfgang; and Sigmund, Gunther, 4,548,355, Cl. 236-37.000.
Dainichi-Nippon Cables, Ltd.: *See*—
Rokunohe, Mitsuru; Nakajima, Toshiyuki; Iwata, Kansei; and Tajima, Hiroyuki, 4,549,175, Cl. 340-794.000.
Dainippon Ink and Chemicals, Inc.: *See*—
Nemoto, Yuhei; Shigeta, Sadaaki; and Yokokawa, Yoshio, 4,548,889, Cl. 430-273.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Shimohiro, Yoshiyuki; Ogawa, Masazo; and Ohnishi, Tooru, 4,548,648, Cl. 106-208.000.
Dalboussiere, Gerard: *See*—
Castel, Rene; Dalboussiere, Gerard; and Kulakowski, Michel, 4,549,296, Cl. 371-16.000.
Dalcanale, Enrico; Bottaccio, Giorgio; Campolmi, Stefano; and Montanari, Fernando, to Montedison S.p.A. Process for oxidizing aldehydes to carboxylic acids. 4,549,025, Cl. 546-327.000.
Dalke, Charles A.; and Stoll, Bradley G., to General Electric Company. Outlet plug for recirculation loop of nuclear reactor. 4,548,783, Cl. 376-204.000.
Daly, Jeffery E.; and Pastusek, Paul E., to Reed Rock Bit Company. Drill bit having a failure indicator. 4,548,280, Cl. 175-40.000.
Damco Testers, Inc.: *See*—
Nousak, Matthew J. A., 4,548,069, Cl. 73-49.500.
Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Method and apparatus for forming a plastic enclosure for fluids with selectively interconnectable internal compartments. 4,548,023, Cl. 53-452.000.
Danfoss A/S: *See*—
Eskildsen, Christian, 4,548,239, Cl. 137-625.680.
Thomsen, Svend E.; and Christensen, Thorkild, 4,548,035, Cl. 60-384.000.
D'Aniello, Michael J., Jr.; Monroe, David R.; and Krueger, Martin H., to General Motors Corporation. Regeneration of phosphorus poisoned automotive catalysts. 4,548,911, Cl. 502-28.000.
Danna, John M.; and Speros, Mark. Stadium seat arm gripping tray. 4,548,326, Cl. 211-71.000.
Datakey, Inc.: *See*—
Flies, William P., 4,549,076, Cl. 235-382.000.
David, Chris A. Game device. 4,548,413, Cl. 273-186.00A.
Davidson, Donald J.: *See*—
Sheill, David D.; Davidson, Donald J.; and Dettloff, David J., 4,548,300, Cl. 188-73.100.
Davis, Cynthia E.: *See*—
Brown, William B.; and Davis, Cynthia E., 4,548,967, Cl. 524-56.000.
Davis, Marshall E.: *See*—
Sung, Rodney L.; and Davis, Marshall E., 4,548,616, Cl. 44-77.000.
Davis, Roy M., to Niagara Machine & Tool Works. Barrier guard for shears, presses and the like. 4,548,095, Cl. 74-612.000.
Davis, William M.: *See*—
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; Foroulis, Z. Andrew; and Baldwin, Francis P., 4,548,995, Cl. 525-354.000.
Dawson, Stanley R.: *See*—
Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., 4,548,661, Cl. 156-52.000.

Day, Frederic F.; Powers, William J., III; Ewen, Eric D.; and Piper, Gerald L., to Texaco Inc. Esterification of wax oxidates. 4,548,754, Cl. 260-410.90R.

Day, San-Tong. Full-automatic umbrella. 4,548,222, Cl. 135-24.000.

Dayco Corporation: *See—*
LiVolsi, William J., 4,547,953, Cl. 29-453.000.
Mathieu, Julien C., 4,548,666, Cl. 156-245.000.
Meadows, Roger D., 4,548,858, Cl. 428-224.000.

Dean, Stewart. Reading device for the visually handicapped. 4,548,485, Cl. 353-67.000.

DeBons, Francis E.; Whittington, Lawrence E.; and Pedersen, Larry D., to Getty Oil Company; and Reed Lignin, Inc. Method of enhanced oil recovery and compositions useful therein. 4,548,721, Cl. 252-8.55D.

de Bruin, Henderikus J.; and Badwal, Sukhvinder P. S., to Flinders University of South Australia, The. Method for determining the partial pressure of oxygen in an atmosphere. 4,548,680, Cl. 204-1.00T.

Deckers, Willem H. M.; and Op de Beek, Johannes C. A., to U.S. Philips Corporation. Method of and device for image reconstruction in computed tomography. 4,549,265, Cl. 364-414.000.

De Clercq, Erik D. A.; Vander Haeghe, Hubert J. H. E.; and Busson, Roger H. C. Derivatives of 9-(2-hydroxyethoxymethyl) guanine. 4,548,819, Cl. 424-253.000.

Decoustics Limited: *See—*
Hintsa, Roy A., 4,548,010, Cl. 52-484.000.

Degesch GmbH: *See—*
Dove, Robert L., 4,548,336, Cl. 221-203.000.

Deggendorfer Werft und Eisenbau GmbH: *See—*
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, 4,549,032, Cl. 585-445.000.

DeGore, James A. Support receptacle for a newspaper, magazine or the like. 4,548,376, Cl. 248-205.400.

Degussa Aktiengesellschaft: *See—*
Grimm, Dieter, 4,549,162, Cl. 338-28.000.

de Jong, Krijn P.: *See—*
Geus, John W.; and de Jong, Krijn P., 4,548,921, Cl. 502-330.000.

Delfino, Michelangelo, to Fairchild Camera & Instrument Corp. Laser treatment of silicon nitride. 4,549,064, Cl. 219-121.0LM.

DelMastro, Bartolomeo P.; and Eckart, Frederick, to United Technologies Corporation. Feather seal slot for vanes. 4,549,058, Cl. 219-121.0LC.

Delmer, Daniel W. C.; and Delmer, William A., to Delmer, William W. C. Multichamber drip irrigation hose. 4,548,360, Cl. 239-542.000.

Delmer, William A.: *See—*
Delmer, Daniel W. C.; and Delmer, William A., 4,548,360, Cl. 239-542.000.

Delmer, William W. C.: *See—*
Delmer, Daniel W. C.; and Delmer, William A., 4,548,360, Cl. 239-542.000.

Delphax Systems: *See—*
Stirrat, John C.; Hurley, Kenneth L.; and Whittaker, Brian F., 4,548,490, Cl. 355-3.0DD.

Del Roso, Americo. Rudder for aquatic craft. 4,548,149, Cl. 114-162.000.

del Soldato, Piero: *See—*
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.

Dempsey, John M., to Ultralight Flight, Inc. Ultralight aircraft. 4,548,371, Cl. 244-13.000.

Denis, Bernard. Apparatus for presenting a target at a window. 4,548,414, Cl. 273-367.000.

Denis, Robert: *See—*
Nebon, Jean-Pierre; Barnel, Pierre; Denis, Robert; and Bertrand, Claude, 4,549,242, Cl. 361-115.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Ayabe, Mitsukuni; Shimizui, Tunehiko; Kibayashi, Iwao; and Hirano, Hideki, 4,549,028, Cl. 548-308.000.

Dennis, Edmund G., to Cashin Systems Corporation. Slicing machine. 4,548,108, Cl. 83-27.000.

Dennis Smith Consulting Ltd.: *See—*
Smith, Dennis C.; and Maijer, Rolf, 4,548,583, Cl. 433-228.100.

Dennison Manufacturing Co.: *See—*
Galante, Richard J., 4,548,857, Cl. 428-200.000.
Paradis, Joseph R., 4,548,242, Cl. 140-123.600.

de Nora, Oronzio: *See—*
Nidola, Antonio; and de Nora, Oronzio, 4,548,697, Cl. 204-290.00R.

DeRoche, Pierre; and Kirby, Neil V., to Dow Chemical Company, The. Bis-(norbornyl or substituted norbornyl) derivatives of a phenol or a phenylamine, process for their preparation and compositions containing same. 4,548,976, Cl. 524-249.000.

Derr, Paul B., to AMP Incorporated. Zero mating force terminal having wiping action. 4,548,457, Cl. 339-88.00R.

Des Case Corporation: *See—*
Waller, James E., 4,548,624, Cl. 55-274.000.

Desalination Systems, Inc.: *See—*
Kirwan, John R., Jr.; and Bray, Donald T., 4,548,714, Cl. 210-232.000.

DeSutter, David A.: *See—*
Huitema, Thomas W.; and DeSutter, David A., 4,548,094, Cl. 74-526.000.

Dettloff, David J.: *See—*
Sheill, David D.; Davidson, Donald J.; and Dettloff, David J., 4,548,300, Cl. 188-73.100.

Deur, Michel; and Toth, Istvan, to Sandoz Ltd. Process for the preparation of condensed triazoles. 4,549,026, Cl. 548-257.000.

Deuring, Hans, to Goetze AG. Seal assembly, particularly for liquid pumps. 4,548,547, Cl. 415-170.00A.

Deutsche Babcock Werke Aktiengesellschaft: *See—*
Gladisch, Manfred; and Winklmann, Erwin, 4,548,386, Cl. 251-327.000.

Deverill, Robert J.: *See—*
Glinn, Terence G. J.; and Deverill, Robert J., 4,548,256, Cl. 164-529.000.

DeVries, James H.; and Dufek, John H., to DLP Inc. Surgical knife cleaner. 4,547,923, Cl. 15-104.00R.

deWalle, Richard T.: *See—*
deWalle, Stewart; and deWalle, Richard T., 4,547,962, Cl. 29-606.000.

deWalle, Stewart; and deWalle, Richard T., to Miep Holdings Inc. Method of making eddy-current probes. 4,547,962, Cl. 29-606.000.

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Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,548,970, Cl. 524-98.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,549,006, Cl. 528-73.000.

Diamond Shamrock Chemicals Company: *See—*
Gilligan, Thomas J., III, 4,548,720, Cl. 252-8.50B.

Diaz, Jose A., to General Portland, Inc. Apparatus for automatically placing bags. 4,548,243, Cl. 141-114.000.

Diazzi, Claudio: *See—*
Stefani, Fabrizio; Cini, Carlo; and Diazzi, Claudio, 4,549,095, Cl. 307-254.000.

Dickakian, Ghazi B., to Du Pont de Nemours, E. I., and Company. Pitch for direct spinning into carbon fibers. 4,548,703, Cl. 208-22.000.

Dickakian, Ghazi B., to Du Pont de Nemours, E. I., and Company. Pitch for direct spinning into carbon fibers derived from a steam cracker tar feedstock. 4,548,704, Cl. 208-22.000.

Dickey, Leland C., to InterNorth, Inc. Continuous flow separation with moving boundary sorption. 4,548,802, Cl. 423-659.000.

Dickey, Leland C., to InterNorth, Inc. Continuous flow separation with moving boundary sorption. 4,548,803, Cl. 423-659.000.

Dickinson, Peter; and Ellwood, Michael, to Sericol Group Limited. Water-based photopolymerizable compositions and their use. 4,548,890, Cl. 430-280.000.

Dickson, LeRoy D.: *See—*
Cato, Robert T.; Dickson, LeRoy D.; and Stokes, Olen L., Jr., 4,548,463, Cl. 350-3.710.

Diefenbach, Horst: *See—*
Geist, Michael; Diefenbach, Horst; and Dobbelstein, Arnold, 4,548,965, Cl. 523-456.000.

Diener, Lester; and Miller, Ernest J. Automatic food cooking machine. 4,548,130, Cl. 99-345.000.

Dieter Graesslin Feinwerktechnik: *See—*
Thoma, Friedrich X., 4,549,154, Cl. 335-87.000.

Dieterich, Charles B., to RCA Corporation. Video disc encoding and decoding system providing intra-field track error correction. 4,549,228, Cl. 358-342.000.

Dietrich, Anton; Hartig, Klaus; Lenz, Werner; and Scherer, Michael, to Leybold-Heraeus GmbH. Thermally insulating glazing. 4,548,691, Cl. 204-192.00P.

Dietrich, William J., Sr.; and Sizelove, Cary L., to DMI, Inc. Spring reset mechanism for tillage tool. 4,548,277, Cl. 172-265.000.

Digital Marine Electronics Corporation: *See—*
Michaels, Sheldon B.; and Giubardo, Mark J., 4,549,312, Cl. 455-311.000.

Dinger, Hans; and Klotz, Helmut, to MTU Friedrichshafen GmbH. Turbocharged internal combustion engine. 4,548,039, Cl. 60-606.000.

Dinh, Chan T.: *See—*
Bournonville, Jean-Paul; and Dinh, Chan T., 4,548,918, Cl. 502-154.000.

Dinsmore, Jeffrey P., to Magnetic Controls Company. Electrical jack. 4,548,447, Cl. 339-14.00R.

DiRocco, David J.: *See—*
DiRocco, Jobbie; and DiRocco, David J., 4,548,102, Cl. 81-15.700.

DiRocco, Jobbie; and DiRocco, David J. Hole filling system for tires. 4,548,102, Cl. 81-15.700.

Disco Abrasive Systems, Ltd.: *See—*
Kajiyama, Keiichi, 4,547,998, Cl. 51-206.00R.

DiTroia, Anthony J., to AT&T Technologies, Inc. Methods of and fixture for establishing an electrical connection. 4,547,960, Cl. 29-593.000.

Diving Unlimited International, Inc.: *See—*
Long, Richard W.; and Stinton, Robert T., 4,547,904, Cl. 2-2.10R.

Dixon, Thomas O., to Amstar Technical Products Co., Inc. Signal distribution system. 4,549,185, Cl. 343-368.000.

DLP Inc.: *See—*
DeVries, James H.; and Dufek, John H., 4,547,923, Cl. 15-104.00R.

DMI, Inc.: *See—*
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,548,277, Cl. 172-265.000.

Dobbelstein, Arnold: *See—*
Geist, Michael; Diefenbach, Horst; and Dobbelstein, Arnold, 4,548,965, Cl. 523-456.000.

Dobberstein, Edward A., to International Business Machines Corporation. Low leakage transformers for efficient line isolation in VHF switching power supplies. 4,549,130, Cl. 323-308.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Beisswenger, Siegfried; and Boppel, Wolfgang, 4,549,067, Cl. 219-121.0EK.

Doering, Charles W., to Brinly-Hardy Co., Inc. Material spreader. 4,548,362, Cl. 239-685.000.

Doi, Hidemi; Okamoto, Takanori; and Matsuda, Hideaki, to Okura Koygo Kabushiki Kisha. Two-part type adhesives. 4,548,992, Cl. 525-167.000.

Doi, Yasuhiro: *See*—
Matsui, Toshio; Doi, Yasuhiro; Kinoshita, Keichi; and Ishiguro, Kuniaki, 4,548,403, Cl. 271-296.000.

Dolenc, Anton: *See*—
Forsthuber, Peter; Visek, Tomas; and Dolenc, Anton, 4,548,170, Cl. 123-195.00A.

Dolev, Moshe: *See*—
Bahry, Avraham; and Dolev, Moshe, 4,548,058, Cl. 70-56.000.

Doljack, Frank A.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,549,161, Cl. 338-20.000.

DoMinh, Thap, to Eastman Kodak Company. Photothermographic element and process. 4,548,897, Cl. 430-351.000.

Dominion Tool & Die Company, Inc.: *See*—
Lawson, Lawrence J., 4,547,945, Cl. 29-407.000.

Domnanovich, James R.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,548,204, Cl. 128-700.000.

Donermeyer, Donald D.; Martins, Joseph J., deceased (by Martins, Alice J., executrix); and by Martins, Joseph C., executor, to Monsanto Company. Hot melt adhesive compositions. 4,548,996, Cl. 525-420.500.

Donetti, Arturo: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.

Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, to Toyota Jidosha Kabushiki Kaisha; and Art Metal Manufacturing Co. Ltd. Piston with local inorganic fiber reinforcement and method of making the same. 4,548,126, Cl. 92-213.000.

Donomoto, Tadashi: *See*—
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,548,253, Cl. 164-80.000.

Dorina Nahmaschinene GmbH: *See*—
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Dorpinghaus, Herbert; and Eikermann, Gerhard. Method of making dental prostheses. 4,548,582, Cl. 433-213.000.

Dorr-Oliver Incorporated: *See*—
Lewis, Kenneth D.; and Potts, Timothy A., 4,548,545, Cl. 415-90.000.

Dorschner, Terry A.: *See*—
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Doucet, Joel R.: *See*—
Serres, Bernard M.; and Doucet, Joel R., 4,549,170, Cl. 340-568.000.

Douji, Ryuhachirou: *See*—
Suzuki, Etsuji; Uno, Shinichi; Chiyoda, Kiyomu; and Douji, Ryuhachirou, 4,549,206, Cl. 358-106.000.

Dove, Robert L., to Degesch GmbH. Tablet dispenser. 4,548,336, Cl. 221-203.000.

Dow Chemical Company, The: *See*—
DeRoche, Pierre; and Kirby, Neil V., 4,548,976, Cl. 524-249.000.
Eilers, Louis H., 4,548,270, Cl. 166-291.000.
Feay, Darrell C., 4,548,991, Cl. 525-146.000.
Stevens, James C.; and Perettie, Donald J., 4,548,686, Cl. 204-158.0HA.
Weiss, Thomas M., 4,549,134, Cl. 324-61.00R.

Dow Corning Corporation: *See*—
Bauman, Therese M.; and Lee, Chi-Long, 4,548,958, Cl. 521-122.000.
Lim, Thomas F.; and Wright, Antony P., 4,549,003, Cl. 528-42.000.
Vincent, Harold L., 4,548,733, Cl. 252-310.000.

Dowty Mining Equipment Limited: *See*—
Bishop, Christopher J.; Cumner, Geoffrey M.; and Waters, John H., 4,548,527, Cl. 405-294.000.

Dozsa, Laszlo ; Pelencei, Jeno; and Somodi, Gyula, to Telefongyar. Anti-slip fixing device for ribbon-type straps and cables. 4,548,460, Cl. 339-107.000.

Drabouski, Stephen J., Jr. Moment stability system for large vessels. 4,549,267, Cl. 364-463.000.

Drackett Company, The: *See*—
Shaer, Elias H., 4,548,727, Cl. 252-171.000.

Dravo Corporation: *See*—
Briggs, Aubrey C., 4,548,315, Cl. 198-728.000.

Dresser Industries, Inc.: *See*—
Mariano, Charles F., 4,548,075, Cl. 73-202.000.
Shinn, Calvin W.; and Terry, Robert G., 4,548,284, Cl. 175-346.000.

Drewett, Glen E. Readily replaceable bumper guard support and bumper for water covered areas. 4,548,150, Cl. 114-219.000.

Driessen, Wilhelmus G. M., to Xerox Corporation. Corona generating device. 4,549,244, Cl. 361-229.000.

Driskill, Darrel, to Larson Supply Company. Downhole well fishing assembly. 4,548,437, Cl. 294-86.300.

Drucker, Alan S., to Carrier Corporation. High efficiency fan coil unit. 4,548,050, Cl. 62-291.000.

Dubich, Charles S.; and Yang, James H. C., to Firestone Tire & Rubber Company, The. Membrane fastener apparatus. 4,548,016, Cl. 52-749.000.

Dufek, John H.: *See*—
DeVries, James H.; and Dufek, John H., 4,547,923, Cl. 15-104.00R.

Dugan, Larry M.: *See*—
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Duhault, Jacques: *See*—
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Boulanger, Michelle, 4,548,820, Cl. 514-255.000.

Dulapa, Mark J., to Technicare Corporation. Hole-fill technique for diagnostic ultrasound imaging systems. 4,549,210, Cl. 358-112.000.

Duncan, Don P.; and Cameron, Timothy B., to Westvaco Corporation. Rosin pentaerythritol ester preparation improvement. 4,548,746, Cl. 260-104.000.

Duncan, Robert B., to Ethicon, Inc. Mesh tissue fasteners. 4,548,202, Cl. 128-334.00C.

Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., to USM Corporation. Lead sensing system. 4,549,087, Cl. 250-561.000.

Dunn, Stephen J.; and Sparrow, Alan W. Piston for internal combustion engine. 4,548,127, Cl. 92-220.000.

Du Pont de Nemours, E. I., and Company: *See*—
Cluff, Stephen L.; Strolle, Clifford H.; and Breazeale, Robert D., 4,548,963, Cl. 523-427.000.
Cullen, Robert E.; Kurowski, Henry B.; and Sidwell, William S., 4,547,938, Cl. 28-254.000.
Dickakian, Ghazi B., 4,548,703, Cl. 208-22.000.
Dickakian, Ghazi B., 4,548,704, Cl. 208-22.000.
Finizio, Michael, 4,548,943, Cl. 514-393.000.
Finizio, Michael, 4,548,946, Cl. 514-393.000.
Garrison, William E., Jr., 4,548,978, Cl. 524-314.000.
Hageman, Larry H.; and Roy, Gerald A., Jr., 4,548,638, Cl. 71-93.000.
Heiart, Robert B., 4,548,884, Cl. 430-22.000.
Hormadaly, Jacob, 4,548,741, Cl. 252-518.000.
Hormadaly, Jacob, 4,548,742, Cl. 252-519.000.
Lauterbach, Herbert G., 4,547,933, Cl. 19-0.350.
Lewis, William, 4,548,975, Cl. 524-147.000.

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Dursch, Walter: *See*—
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Duwel, Edward C.: *See*—
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DY-Core Systems Ireland Limited: *See*—
Bunn, Christopher B., 4,548,565, Cl. 425-64.000.

Dyer, David C., to Weston, Paul. Collapsible framework. 4,548,012, Cl. 52-646.000.

Dynatech Laboratories Incorporated: *See*—
Crandell, William H.; Moren, John L.; and Ruona, Paul Q., 4,548,245, Cl. 141-237.000.

E.C.H. Will (GmbH & Co.): *See*—
Brandt, Eckhard; and Schultz, Friedrich, 4,548,404, Cl. 271-303.000.

E. F. Johnson Company: *See*—
Baumler, Robert J., 4,549,246, Cl. 361-293.000.

E. R. Squibb & Sons, Inc.: *See*—
Kimball, Spencer D.; Kronenthal, David; and Koster, William H., 4,548,751, Cl. 260-245.400.
Zahler, Robert, 4,548,747, Cl. 260-239.00A.

Eastman Kodak Company: *See*—
Bayer, Bryce E., 4,549,212, Cl. 358-167.000.
Crawley, Michael W., 4,548,888, Cl. 430-223.000.
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Wu, Tai-Wing, 4,548,905, Cl. 436-97.000.

Eaton Corporation: *See*—
Calviello, Joseph A., 4,549,194, Cl. 357-30.000.
Forsell, Kenneth A.; and Theisen, Peter J., 4,549,153, Cl. 335-16.000.
Gale, Allan R., 4,549,121, Cl. 318-301.000.

Eaton, John W. Method and agents for raising animal tolerance to oxidant stress-inducing antibiotics. 4,548,927, Cl. 514-34.000.

Ebato, Seigo: *See*—
Yamada, Motoshige; and Ebato, Seigo, 4,548,898, Cl. 430-510.000.

Eckart, Frederick: *See*—
DelMastro, Bartolomeo P.; and Eckart, Frederick, 4,549,058, Cl. 219-121.0LC.

Ecker, Mario E.; and Olson, Leonard T., to International Business Machines Corporation. Repairable multi-level overlay system for semiconductor device. 4,549,200, Cl. 357-80.000.

Eckert, Alton B.; and Duwel, Edward C., to Pitney Bowes, Inc. Electronic postage meter having keyboard entered combination for recharging. 4,549,281, Cl. 364-900.000.

Economatics (Education) Limited: *See*—
Townsend, Max F., 4,548,584, Cl. 434-118.000.

Eddens, Fletcher C., to General Electric Company. Bow control for metallic structures. 4,548,657, Cl. 148-133.000.

Eddleston, Ian: *See*—
Laflin, Philip; Eddleston, Ian; and Hepworth, Mathew A., 4,548,678, Cl. 162-146.000.

Eden, Brian W. Sprinkler head trimmer and cleaner. 4,547,966, Cl. 30-300.000.

Eguchi, Takeo: *See*—
Hashimoto, Yoshitaka; and Eguchi, Takeo, 4,549,227, Cl. 358-328.000.

Ehl, James H.: *See*—
Schuerer, Paul H.; Ehl, James H.; and Prasthofer, Willibald P., 4,548,083, Cl. 73-827.000.

Ehring, Markus. Attachment for spectacle temples. 4,548,484, Cl. 351-123.000.
Eibeck, Richard E.: *See—*
Nalewajek, David; Eibeck, Richard E.; and Sukornick, Bernard, 4,548,881, Cl. 429-194.000.
Eikermann, Gerhard: *See—*
Dorpinghaus, Herbert; and Eikermann, Gerhard, 4,548,582, Cl. 433-213.000.
Eiland, Harry F., to Xerox Corporation. Counterbalance subsystem to accommodate a variable center of gravity. 4,548,491, Cl. 355-3.00R.
Eilers, Louis H., to Dow Chemical Company, The. Process for plugging a subterranean formation. 4,548,270, Cl. 166-291.000.
Eisert, Wolfgang; and Beisker, Wolfgang, to Gesellschaft fur Strahlen- und Umweltforschung mbH. Arrangement for measuring fluorescence polarization. 4,548,499, Cl. 356-318.000.
Eklund, Urban, to Kockums Industri AB. Method of processing curved logs. 4,548,247, Cl. 144-357.000.
Elba-Werk Maschinen-Gesellschaft mbH & Co.: *See—*
Bruder, Gerhard; and Pippinger, Horst, 4,548,538, Cl. 414-332.000.
Electronic Designs (I.W.) Limited: *See—*
Taylor, Andrew J.; and McGillvray, Philip J., 4,549,127, Cl. 320-21.000.
Eli Lilly and Company: *See—*
Higgins, Harvey M., Jr.; Merkel, Kurt E.; and McCormick, Mack H., 4,548,925, Cl. 514-10.000.
Michel, Karl H., 4,548,924, Cl. 514-10.000.
Elliott Turbomachinery Company, Inc.: *See—*
Miller, Robert A.; and Condrac, Edward J., 4,548,040, Cl. 60-619.000.
Ellison, Edward; and Gruber, Otto R., to New York Telephone Company. Bridging connector assembly and method of using same. 4,548,448, Cl. 339-17.00C.
Ellsworth, Laurett. Adjustable diaper. 4,548,604, Cl. 604-399.000.
Ellwood, Michael: *See—*
Dickinson, Peter; and Ellwood, Michael, 4,548,890, Cl. 430-280.000.
Elmwood Sensors Limited: *See—*
Krohn, Rasmus A. R., 4,548,780, Cl. 264-272.150.
Elsby, Leif E.: *See—*
Alvryd, Karl B. G.; Elsby, Leif E.; and Uneback, Hans I., 4,548,647, Cl. 106-164.000.
Elson, John M., to United States of America, Navy. Nondestructive analysis of multilayer roughness correlation. 4,548,506, Cl. 356-446.000.
Elson, Thomas D.; and Millhone, Ralph S., to Chevron Research Company. Steam injection well gravel prepack material of sintered bauxite. 4,548,269, Cl. 166-276.000.
Elzer, Albert: *See—*
Lynch, John; and Elzer, Albert, 4,548,894, Cl. 430-273.000.
Emhart Industries, Inc.: *See—*
Nebelung, Hermann H., 4,548,633, Cl. 65-29.000.
Nebelung, Hermann H., 4,548,635, Cl. 65-84.000.
EMI Limited: *See—*
Severwright, Jeremy S., 4,549,093, Cl. 307-147.000.
Vaidya, Ashok W., 4,549,135, Cl. 324-248.000.
Endo, Kaoru: *See—*
Yamagiwa, Tokio; Ishikawa, Toshio; Ozawa, Jun; Endo, Kaoru; and Hosokawa, Masao, 4,549,132, Cl. 324-54.000.
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Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,549,034, Cl. 17-17.0LF.
Endress U. Hauser GmbH u. Co.: *See—*
Kastel, Walter, 4,548,086, Cl. 73-862.650.
Engebretson, A. Maynard; Morley, Robert E., Jr.; and Popelka, Gerald R., to Central Institute for the Deaf. Hearing aids, signal supplying apparatus, systems for compensating hearing deficiencies, and methods. 4,548,082, Cl. 73-585.000.
Engel, Reinhard: *See—*
Steinmann, Peter; Engel, Reinhard; Parstorfer, Richard; Brugger, Rudolf; and Jonke, Gerhard, 4,548,669, Cl. 156-358.000.
Engle, Donald W.; and Hahn, Roger S., to Rock-Tenn Company. Interlock on collapsible cross partitions. 4,548,350, Cl. 229-15.000.
Enjoji, Susumu; and Saito, Koji, to Tokyo Shibaura Denki Kabushiki Kaisha. Probe for ultrasonic-echo planigraphic imaging apparatus. 4,548,210, Cl. 128-660.000.
Erard, Raoul-Henri. Watch with indicator of lunar phases. 4,548,512, Cl. 368-15.000.
Erdman, Timothy R., to Chevron Research Company. Dispersant lubricating oil additives. 4,548,722, Cl. 252-33.000.
Eriksson, Sune; Johansson, Borje; and Santen, Sven, to SKF Steel Engineering AB. Condensing zinc vapor. 4,548,621, Cl. 55-72.000.
Erland, Jonathan, to Apogee, Inc. Projection screen. 4,548,470, Cl. 350-129.000.
Ernst, Hubert: *See—*
Wevers, Jean; Ernst, Hubert; Cassidy, Stephen; and Barrat, Christian R., 4,548,757, Cl. 260-502.50E.
Ernst Leitz Wetzlar GmbH: *See—*
Sehlapp, Werner; and Mulch, Herbert, 4,548,471, Cl. 350-255.000.
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, to International Business Machines Corporation. Magnetic head slider of ceramic material. 4,549,238, Cl. 360-103.000.
Erwin Sick GmbH Optik-Elektronik: *See—*
Herzer, Gerhard, 4,549,086, Cl. 250-561.000.
Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., to United States of America, Air Force. Method for assembling a multiconductor flat cable. 4,548,661, Cl. 156-52.000.
Eskildsen, Christian, to Danfoss A/S. Hydraulic slide valve. 4,548,239, Cl. 137-625.680.
Essig, Karl, to H. Stoll GmbH & Co. Knitted fabric and method of producing the same. 4,548,057, Cl. 66-172.00R.
Ethicon, Inc.: *See—*
Duncan, Robert B., 4,548,202, Cl. 128-334.00C.
Eue, Ludwig: *See—*
Riebel, Hans-Jochem; Eue, Ludwig; Faust, Wilfried; and Priesnitz, Uwe, 4,548,639, Cl. 71-94.000.
Euro California, Inc.: *See—*
Saccoccia, Pasqualino, 4,548,387, Cl. 254-10.00B.
Evans, Dain S.; Georgiou, George A.; Mossman, Peter; Mukherjee, Arabinda; and Whiscombe, John B. Optical fibre coupling assemblies. 4,548,466, Cl. 350-96.200.
Evans, Keith M., to General Motors Corporation. Sheath for storing and presenting shoulder belt. 4,548,425, Cl. 280-808.000.
Everpure, Inc.: *See—*
Regunathan, Perialwar; Tadlock, John W.; and Jarog, Dean J., 4,548,227, Cl. 137-268.000.
Evrard, Paul: *See—*
Avenel, Michel; Evrard, Paul; and Leca, Jean-Paul, 4,549,033, Cl. 136-251.000.
Ewen, Eric D.: *See—*
Day, Frederic F.; Powers, William J., III; Ewen, Eric D.; and Piper, Gerald L., 4,548,754, Cl. 260-410.90R.
Ex-Cell-O Corporation: *See—*
Risko, Frank D.; and Lewis, Thomas D., 4,548,244, Cl. 141-156.000.
Exxon Production Research Co.: *See—*
Chiu, Chen-hwa, 4,548,629, Cl. 62-17.000.
Keller, Stuart R., 4,548,271, Cl. 166-291.000.
Exxon Research and Engineering Co.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,548,700, Cl. 208-10.000.
Bock, Jan; and Valint, Paul L., Jr., 4,548,735, Cl. 252-312.000.
Fiato, Rocco A.; and Kugler, Edwin L., 4,548,953, Cl. 518-717.000.
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; Foroulis, Z. Andrew; and Baldwin, Francis P., 4,548,995, Cl. 525-354.000.
Rey, S. Frank, 4,548,961, Cl. 523-220.000.
Rice, Gary W., 4,548,798, Cl. 423-263.000.
Eylon, Daniel: *See—*
Weiss, Isaac; Froes, Francis H.; and Eylon, Daniel, 4,548,903, Cl. 436-5.000.
Ezer, Elemer: *See—*
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.
Ezure, Tadayoshi, to Hosiden Electronics Co., Ltd. Connector with lock mechanism. 4,548,455, Cl. 339-45.00M.
Fabiny, William J.: *See—*
Mosser, Mark F.; and Fabiny, William J., 4,548,646, Cl. 106-14.120.
Fag Italiana SpA: *See—*
Ravinale, Stefano; and Vernocchi, Vittorio, 4,548,518, Cl. 384-490.000.
Fahlen, Theodore S.; and Mass, Barton, to Standard Oil Company (Indiana). Electrical excitation circuit for gas lasers. 4,549,091, Cl. 307-106.000.
Fahrenschon, Kurt: *See—*
Brendle, Konrad; Schiffer, Harald; and Fahrenschon, Kurt, 4,548,475, Cl. 350-334.000.
Fain, Gilbert: *See—*
Moura, Michael; Gonsalves, Lenine; and Fain, Gilbert, 4,549,169, Cl. 340-539.000.
Fairchild Camera & Instrument Corp.: *See—*
Delfino, Michelangelo, 4,549,064, Cl. 219-121.0LM.
Falk, David O.: *See—*
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., 4,548,272, Cl. 166-295.000.
Fanuc Ltd.: *See—*
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,549,276, Cl. 364-513.000.
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Ichimura, Akio, 4,549,271, Cl. 364-474.000.
Farcasiu, Malvina: *See—*
Bowes, Emmerson; Farcasiu, Malvina; and Scott, Eric J. Y., 4,548,709, Cl. 208-213.000.
Farina, Alfonso, to Selenia SpA. Interference suppressor for an electronically or mechanically scanning monopulse radar generating sum and difference signals from received microwave energy. 4,549,183, Cl. 343-7.00A.
Farmhand, Inc.: *See—*
Lenertz, John B.; and Moore, Carroll E., 4,548,543, Cl. 414-686.000.
Farr, Glyn P. R., to Girling Limited. Hydraulic power boosters for vehicles braking systems. 4,548,037, Cl. 60-552.000.
Faust, Wilfried: *See—*
Riebel, Hans-Jochem; Eue, Ludwig; Faust, Wilfried; and Priesnitz, Uwe, 4,548,639, Cl. 71-94.000.
FBC Limited: *See—*
Gates, Peter S., 4,549,027, Cl. 548-262.000.

Feay, Darrell C., to Dow Chemical Company, The. Blends of polycarbonate or polyestercarbonate with 4-methyl-1-pentene polymers. 4,548,991, Cl. 525-146.000.

Feit, Josef. Surface box. 4,548,230, Cl. 137-369.000.

Feitelson, Ira S. Cat litter box. 4,548,160, Cl. 119-1.000.

Fengler, Gerd; Arlt, Dieter; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 4H-1,4-Benzothiazine derivatives. 4,548,934, Cl. 514-225.000.

Fennemann, Wolfgang: *See*—
Sauer, Harald; Schmidt, Hans-Werner; and Fennemann, Wolfgang, 4,548,797, Cl. 423-240.000.

Feodor Burgmann Dichtungswerke GmbH & Co.: *See*—
Bendl, Peter, 4,548,415, Cl. 277-100.000.

Ferrar, Carl M.: *See*—
Nighan, William L.; Wiegand, Walter J.; and Ferrar, Carl M., 4,549,109, Cl. 313-485.000.

Ferry, John D.: *See*—
Muller, Michael F.; and Ferry, John D., 4,548,736, Cl. 252-315.100.

Ferster, Reuben I. Peristaltic pump structure. 4,548,553, Cl. 417-477.000.

Feuchter, Wolfgang: *See*—
Lauschke, Dieter; and Feuchter, Wolfgang, 4,548,030, Cl. 57-302.000.

Fiato, Rocco A.; and Kugler, Edwin L., to Exxon Research and Engineering Co. Production of alkanes from mixtures of CO and H_2. 4,548,953, Cl. 518-717.000.

Fichtel & Sachs Industries, Inc.: *See*—
Smith, Lawther O.; Howard, Timothy L.; and Kautz, Franz A., 4,548,389, Cl. 267-64.110.

Fickert, Werner: *See*—
Orth, Winfried; Pastorek, Emmerich; and Fickert, Werner, 4,549,024, Cl. 546-320.000.

Figgie International Inc.: *See*—
Ackley, Mark W.; and Szafranski, Brian D., 4,548,626, Cl. 55-316.000.

Files, James H.; and Montague, John M., to La Salle Marine, Inc. Replaceable marine fender mechanism. 4,548,151, Cl. 114-219.000.

Filley, Giles F.; and Kindig, Neal B., to Webb-Waring Lung Institute. Composition and method for treating mammalian acidosis. 4,548,817, Cl. 424-127.000.

Fine, Harvey A., to Weldotron Corporation. Integrated stretch-wrap packaging system. 4,548,024, Cl. 53-502.000.

Finizio, Michael, to Du Pont de Nemours, E. I., and Company. Antiinflammatory, analgesic, or anti-primary dysmenorrheal arylmethylene- and arylmethylindenoimidazoles. 4,548,943, Cl. 514-393.000.

Finizio, Michael, to Du Pont de Nemours, E. I., and Company. Antiinflammatory and/or analgesic 1,8-Dihydro-(or 3,8-dihydro)-8-aryl-2-[(substituted)thio]-indeno[1,2-d]imidazoles and their corresponding sulfoxides and sulfones. 4,548,946, Cl. 514-393.000.

Firestone Tire & Rubber Company, The: *See*—
Dubich, Charles S.; and Yang, James H. C., 4,548,016, Cl. 52-749.000.

Fischer, Robert A. Multiple piece cutting tip. 4,548,358, Cl. 239-424.000.

Fish, Falk: *See*—
Herzberg, Max; and Fish, Falk, 4,549,011, Cl. 536-31.000.

Fisher, Glen W., to Technovators, Inc. Flow control insert for hopper bottom bins. 4,548,342, Cl. 222-145.000.

Fleckenstein, Phillip P., to Berwind Corporation. Capacitance-type material level probe and method of manufacture. 4,549,245, Cl. 361-284.000.

Fleissner GmbH & Co.: *See*—
Fleissner, Heinz, 4,548,106, Cl. 83-18.000.

Fleissner, Heinz, to Fleissner GmbH & Co. Process and apparatus for continuous cutting of strip- or rope-like material. 4,548,106, Cl. 83-18.000.

Fletcher, Augustus; and Moriarty, William L., to American Chemical & Refining Company, Inc. Thallium-containing composition for stripping palladium. 4,548,791, Cl. 423-22.000.

Fleurance, Claude; and Naudot, Jean-Claude, to Societe d'Etudes, Recherches et Constructions. Apparatus for real time correlation in seismic prospection. 4,549,285, Cl. 367-60.000.

Fleury, Georges, to Thomson-CSF. Delay line for a travelling wave tube. 4,549,112, Cl. 315-3.600.

Flex Foot, Inc.: *See*—
Phillips, Van L., 4,547,913, Cl. 623-27.000.

Flexillume Canada Ltd.: *See*—
Totten, Thomas B., 4,549,253, Cl. 362-364.000.

Flier, Jeffrey S.: *See*—
Carey, Martin C.; Moses, Alan C.; and Flier, Jeffrey S., 4,548,922, Cl. 514-4.000.

Flies, William P., to Datakey, Inc. Orientation guide arrangement for electronic key and receptacle combination. 4,549,076, Cl. 235-382.000.

Flinders University of South Australia, The: *See*—
de Bruin, Henderikus J.; and Badwal, Sukhvinder P. S., 4,548,680, Cl. 204-1.00T.

Floyd, William M., to United Technologies Automotive, Inc. Debounce circuit providing synchronously clocked digital signals. 4,549,094, Cl. 307-247.00A.

FMC Corporation: *See*—
Aly, Elsayed A., 4,548,640, Cl. 71-98.000.
Bloomquist, George W., 4,548,236, Cl. 137-615.000.

Fogaroli, Giuseppe; and Coli, Giuseppe, to Ing. C. Olivetti & C., S.p.A. Dot matrix printing method and printer therefor. 4,549,222, Cl. 358-296.000.

Folestad, Sven S.; Galle, Bo G.; Johnson, Lars Goran I.; and Josefsson, Bjorn O. Laser induced fluorescence detection in modern liquid chromatography with conventional and micro columns. 4,548,498, Cl. 356-318.000.

Foley, Lary L. Composition for control of bacteria and viruses. 4,548,812, Cl. 424-78.000.

Fonderie Officine Riunite Ing. Graziano di L. Graziano & C.S.a.s.: *See*—
Bacchio, Giovanni, 4,547,936, Cl. 19-258.000.

Ford Motor Company: *See*—
Anderson, Richard W., 4,548,174, Cl. 123-310.000.
Hughson, Douglas, 4,548,562, Cl. 418-189.000.
Middleton, Daryl J.; and Grenier, Jodyne I., 4,548,836, Cl. 427-160.000.
Schneider, Jack H.; and Huber, Gary D., 4,549,266, Cl. 364-426.000.

Ford, Thomas J., to Phillips Petroleum Company. Crimped staple fiber. 4,547,934, Cl. 19-0.560.

Forenade Fabriksverken: *See*—
Hansson, Borje; Johansson, Borje; and Pramskog, Torbjorn, 4,548,122, Cl. 89-37.050.

Foresti, Maria L.: *See*—
Guidelli, Rolando; and Foresti, Maria L., 4,548,679, Cl. 204-1.00T.

Forlani, Fausto: *See*—
Occhialini, Giorgio; Grazia, Gabrio; and Forlani, Fausto, 4,548,313, Cl. 198-430.000.

Foroulis, Z. Andrew: *See*—
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; Foroulis, Z. Andrew; and Baldwin, Francis P., 4,548,995, Cl. 525-354.000.

Forsell, Kenneth A.; and Theisen, Peter J., to Eaton Corporation. Residential circuit breaker with slot motor. 4,549,153, Cl. 335-16.000.

Forsthuber, Peter; Visek, Tomas; and Dolenc, Anton, to Steyr-Daimler-Puch Aktiengesellschaft. Longitudinal housing wall of an internal combustion engine. 4,548,170, Cl. 123-195.00A.

FOSECO International Ltd.: *See*—
Cooper, Kenneth C.; and Pollard, William, 4,548,380, Cl. 249-106.000.

Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, to Pitney Bowes, Inc. Inserter gauging system. 4,548,400, Cl. 271-226.000.

Foster, Derrick W.; and Herring, Robert B., to Anicon, Inc. Chemical vapor deposition wafer boat. 4,548,159, Cl. 118-728.000.

France Bed Co., Ltd.: *See*—
Sasaki, Noboru, 4,548,390, Cl. 267-91.000.

Franklin, Bernice E. Mask cleanser containing oatmeal, powdered milk, baking soda and honey. 4,548,728, Cl. 252-174.140.

Frantz, Robert A.: *See*—
Lech, Thaddeus, Jr.; and Frantz, Robert A., 4,548,302, Cl. 192-106.200.

Frear, David L.: *See*—
Gallusser, David O.; and Frear, David L., 4,548,458, Cl. 339-89.00R.

Fredenhagen KG: *See*—
Kupczyk, Werner, 4,548,135, Cl. 104-135.000.

Freermann, Johannes, to Carl Schmale GmbH & Co. KG. Apparatus for applying ribbon strips to a textile fabric. 4,548,141, Cl. 112-113.000.

Frick Company: *See*—
Murphy, David A.; and Spellar, Peter C., 4,548,549, Cl. 417-53.000.

Friedman, Arthur W.: *See*—
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.

Froes, Francis H.: *See*—
Weiss, Isaac; Froes, Francis H.; and Eylon, Daniel, 4,548,903, Cl. 436-5.000.

Frye, Kenneth G., to Beloit Corporation. Non-dulling slitter. 4,548,117, Cl. 83-500.000.

Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrimido[4,5-d][2]benzazepines useful as sedatives and anxiolytic agents. 4,548,750, Cl. 260-243.300.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Matsuki, Mitsuo, 4,548,038, Cl. 60-602.000.
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,549,163, Cl. 340-52.00R.

Fuji Photo Film Co., Ltd.: *See*—
Agano, Toshitaka, 4,548,477, Cl. 350-358.000.
Hashimoto, Hiroshi; and Okita, Tsutomu, 4,548,833, Cl. 427-44.000.
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Kawamura, Kouichi, 4,548,892, Cl. 430-288.000.
Kanaoka, Takeshi; Nakamura, Katutoshi; and Shimizu, Shigehisa, 4,548,492, Cl. 355-50.000.
Kawamata, Toshio, 4,548,772, Cl. 264-26.000.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,869, Cl. 428-474.700.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,870, Cl. 428-474.700.
Ohara, Yuji, 4,549,190, Cl. 346-108.000.
Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, 4,548,873, Cl. 428-695.000.

Fuji Shashin Film Kabushiki Kaisha: *See*—
Sekikawa, Nobuyoshi; Katsuyama, Harumi; and Kondo, Asaji, 4,548,906, Cl. 436-113.000.

Fuji Xerox Co., Ltd.: *See*—
Kataoka, Kiroyuki, 4,549,077, Cl. 235-384.000.
Nishimoto, Masato, 4,549,297, Cl. 371-33.000.
Ozawa, Takashi, 4,549,088, Cl. 250-578.000.
Shiratsuki, Yoshiyuki, 4,549,189, Cl. 346-76.0PH.
Takashi, Ozawa, 4,549,223, Cl. 358-300.000.
Yamamoto, Tadashi; and Moriguchi, Haruhiko, 4,549,221, Cl. 358-288.000.

Fujie, Kunio: *See*—
Hayashi, Masakatsu; and Fujie, Kunio, 4,548,047, Cl. 62-160.000.

Fujie, Masakatsu: *See*—
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.

Fujieda, Yasuhiko: *See*—
Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, 4,548,564, Cl. 425-32.000.

Fujii, Atsushi, to Idemitsu Petrochemical Co., Ltd. Method of producing thermoplastic resin sheet or film. 4,548,778, Cl. 264-180.000.

Fujii, Noriki: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.

Fujiki, Makoto; and Takayama, Makoto, to Canon Kabushiki Kaisha. Information recording device for video and sound. 4,549,236, Cl. 360-19.100.

Fujikura Ltd.: *See*—
Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.

Fujimori, Yoshinori: *See*—
Kaneko, Nagao; Fujimori, Yoshinori; Shimizu, Seizaburo; and Obara, Shin, 4,549,107, Cl. 310-327.000.

Fujimoto, Masaya: *See*—
Ninomiya, Masakazu; and Fujimoto, Masaya, 4,548,179, Cl. 123-440.000.

Fujioka, Shuji: *See*—
Yokota, Mitsuru; Fujioka, Shuji; Goshima, Tsutomu; Kenjo, Hideki; and Komaki, Kazushige, 4,548,983, Cl. 524-726.000.

Fujisawa, Masao: *See*—
Mizusawa, Mitutoyo; and Fujisawa, Masao, 4,548,445, Cl. 303-22.00A.

Fujita, Fumio: *See*—
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,548,769, Cl. 264-22.000.

Fujita, Hirotsugu: *See*—
Suzuki, Shintaro; Fujita, Hirotsugu; Asami, Yoshiaki; and Homma, Fumiko, 4,548,880, Cl. 429-162.000.

Fujitsu Limited: *See*—
Shirasaki, Masataka, 4,548,478, Cl. 350-377.000.
Takai, Sakan; Iida, Takenori; and Kaneko, Keiichi, 4,549,282, Cl. 365-1.000.
Yamauchi, Takahiko; Seki, Teruo; and Aoyama, Keizo, 4,549,199, Cl. 357-68.000.

Fukuchi, Hiromichi; and Ushioda, Toyoji, to NEC Corporation. Multinozzle ink-jet print head of drop-on-demand type. 4,549,191, Cl. 346-140.00R.

Fukuda, Masuo, to Saikei Giken Kogyo Kabushiki Kaisha. Method for producing a muffler. 4,547,942, Cl. 29-157.00R.

Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, to Victor Company of Japan, Limited. Method of manufacturing information storage mediums. 4,548,777, Cl. 264-107.000.

Fukumori, Kunihiko: *See*—
Miyake, Masaaki; and Fukumori, Kunihiko, 4,548,628, Cl. 55-487.000.

Fukumura, Naoe; Hasegawa, Shunji; and Tanaka, Masanobu, to Yamazaki Machinery Works, Ltd. Method of controlling selection of tools in a quadriaxial numerical control lathe. 4,549,270, Cl. 364-474.000.

Fukuura, Yukio: *See*—
Kitamura, Takashi; Fukuura, Yukio; Tanuma, Itsuo; Shinogaya, Toshikazu; and Noda, Yuji, 4,548,687, Cl. 204-159.170.

Fuller, Robert A.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,548,788, Cl. 422-109.000.

Funada, Fumiaki; Takamatsu, Toshiaki; Yasuda, Shuuhei; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Electrode terminal assembly on a multi-layer type liquid crystal panel. 4,549,174, Cl. 340-784.000.

Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Method for making composite material object by plastic processing. 4,548,253, Cl. 164-80.000.

Fung, Paul S. T.; and Chen, Yun-Tsu. Method for manufacturing a stomatic gargle. 4,548,809, Cl. 424-52.000.

Fure, Barbara J.: *See*—
Jenekhe, Samson A.; and Fure, Barbara J., 4,548,738, Cl. 252-500.000.

Furukawa, Ikuo: *See*—
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Matthews, John C., 4,548,688, Cl. 204-159.180.

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Fuwa, Yoshio: *See*—
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Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,548,882, Cl. 429-211.000.

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Colliopoulos, John A.; Paul, David B.; and Young, James G., 4,548,806, Cl. 424-35.000.

GAF Corporation: *See*—
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,549,007, Cl. 528-76.000.

Gagne, Pierre: *See*—
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,548,734, Cl. 252-311.000.

Galante, Richard J., to Dennison Manufacturing Co. Heat transferable laminate. 4,548,857, Cl. 428-200.000.

Gale, Allan R., to Eaton Corporation. Motor minimum speed start-up circuit for electric motors. 4,549,121, Cl. 318-301.000.

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Gallusser, David O.; and Frear, David L., to Allied Corporation. Electrical connector having a molded anti-decoupling mechanism. 4,548,458, Cl. 339-89.00R.

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Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Wraparound pocket for footwear. 4,547,982, Cl. 36-114.000.

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Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,549,247, Cl. 361-398.000.

Garagnani, Enea; Moro, Alessandro; and Marzola, Roberto, to Montedison S.p.A. Method for improving the characteristics of polyolefins under heating. 4,548,993, Cl. 525-195.000.

Garcia, Michel: *See*—
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Garkisch, Otto-Ludwig: *See*—
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, 4,549,032, Cl. 585-445.000.

Garnett, John F. C., to Linear Textiles Limited. Sealing strips of rows of polypropylene fibers and rows of polytetrafluoroethylene fibers. 4,548,849, Cl. 428-88.000.

Garrison, William E., Jr., to Du Pont de Nemours, E. I., and Company. Fast crystallizing polyester resin containing three-component crystallization system. 4,548,978, Cl. 524-314.000.

Gates, Peter S., to FBC Limited. Fungicidal and plant growth regulant triazole and imidazole sulfide compounds. 4,549,027, Cl. 548-262.000.

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Tacker, Willis A., Jr.; Bourland, Joe D.; Babbs, Charles F.; and Geddes, Leslie A., 4,548,203, Cl. 128-419.00D.

Geist, Michael; Diefenbach, Horst; and Dobbelstein, Arnold, to BASF Farben & Fasern AG. Water-dispersible binders for cationic electrocoating finishes, and process for their preparation. 4,548,965, Cl. 523-456.000.

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Dalke, Charles A.; and Stoll, Bradley G., 4,548,783, Cl. 376-204.000.
Eddens, Fletcher C., 4,548,657, Cl. 148-133.000.
MacFall, James R.; and Wehrli, Felix W., 4,549,139, Cl. 324-309.000.
MacFall, James R., 4,549,140, Cl. 324-309.000.
Mellinger, Gary A.; Giles, Harold F., Jr.; Holub, Fred; and Schlich, William R., 4,548,997, Cl. 525-433.000.

Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., 4,549,241, Cl. 361-45.000.
Richardson, David L.; Patterson, Peter M.; Clark, Jack P.; Stanton, Scott R.; and Perry, Richard W., 4,548,785, Cl. 376-249.000.
Thompson, Craig R.; and Naumann, Ted F., Jr., 4,548,374, Cl. 248-123.100.
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Katz, Saul N.; Proscia, George E.; and Clisura, George L., 4,548,827, Cl. 426-427.000.
Morimoto, Keisuke, 4,548,823, Cl. 426-104.000.

General Motors Corporation: *See*—
Buetemeister, Earl H.; and Colville, Larry L., 4,549,089, Cl. 290-38.00R.
D'Aniello, Michael J., Jr.; Monroe, David R.; and Krueger, Martin H., 4,548,911, Cl. 502-28.000.
Evans, Keith M., 4,548,425, Cl. 280-808.000.
Gest, William E., 4,548,166, Cl. 123-52.00M.
Hartz, James F., 4,548,306, Cl. 192-70.280.
Lang, Paul R., 4,549,050, Cl. 200-314.000.
Pozniak, Donald J., 4,548,185, Cl. 123-571.000.
Rusch, Randy A., 4,547,959, Cl. 29-577.00C.

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Diaz, Jose A., 4,548,243, Cl. 141-114.000.

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Bogenschutz, Thomas M., 4,548,237, Cl. 137-625.220.

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Collins, Walter W., 4,547,937, Cl. 24-607.000.

Germania Dairy Automation, Inc.: *See*—
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Germscheid, Hans-Gunther: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,548,729, Cl. 252-174.210.

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Eisert, Wolfgang; and Beisker, Wolfgang, 4,548,499, Cl. 356-318.000.

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Geus, John W.; and de Jong, Krijn P., to Nederlandse Organisatie Voor Zuiver-Wetenschappellik Ondebzoek (zwo). Silver catalyst and a method for the preparation thereof. 4,548,921, Cl. 502-330.000.

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Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,548,444, Cl. 299-34.000.

Giachetti, Antonio: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.

Gibson, David S.: *See*—
Altares, Romulo A.; Gibson, David S.; Goyda, Michael A.; Hegadorn, Joseph L.; and Kapoor, Virendra N., 4,548,045, Cl. 62-63.000.

Gidlund, Per A. L., to Atlas Copco Aktiebolag. Percussion tool. 4,548,278, Cl. 173-121.000.

Giles, Harold F., Jr.: *See*—
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Gill, Peter J., to GKN Screws & Fasteners Limited. Threaded tappet adjuster. 4,548,168, Cl. 123-90.540.

Gillet, Guy, to Supermarket Systems. System for encouraging the return of vehicles such as trolleys. 4,549,182, Cl. 340-942.000.

Gillett, John B., to International Business Machines Corporation. High-density electrical contact pad pattern. 4,548,452, Cl. 339-17.00R.

Gilligan, Thomas J., III, to Diamond Shamrock Chemicals Company. Removal of hydrogen sulfide from drilling fluids. 4,548,720, Cl. 252-8.50B.

Gillis, Wendell K.: *See*—
Parrott, Kenneth S.; Gillis, Wendell K.; and Baros, Bernard C., 4,548,509, Cl. 366-349.000.

Ginpil, Frederick D.; Milner, Morris; and Senders, John W., to Ontario Crippled Children's Centre. Body supporting network. 4,547,918, Cl. 5-446.000.

Giocastro, Joseph; Giocastro, Salvatore; and Giocastro, Peter. Compact fluid drive transmission. 4,548,096, Cl. 74-650.000.

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Girling Limited: *See*—
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van Leusen, Albert M.; and van Leusen, Adriaan M., 4,548,749, Cl. 260-239.500.

Giubardo, Mark J.: *See*—
Michaels, Sheldon B.; and Giubardo, Mark J., 4,549,312, Cl. 455-311.000.

Givaudan Corporation: *See*—
Hochstetler, Alan R., 4,549,029, Cl. 549-429.000.

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GKN-Stenman AB: *See*—
Nilsson, Erik A., 4,548,061, Cl. 70-370.000.

Gladisch, Manfred; and Winklmann, Erwin, to Deutsche Babcock Werke Aktiengesellschaft. Gate valve. 4,548,386, Cl. 251-327.000.

Glaeser, Wolfgang, to Grillo-Werke AG. Process for preparing zinc powder for alkaline batteries (V). 4,548,642, Cl. 75-0.50B.

Glinn, Terence G. J.; and Deverill, Robert J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Casting of metal articles. 4,548,256, Cl. 164-529.000.

Glommen, Anton L. Reversible chuck. 4,548,417, Cl. 279-5.000.

Glonek, Robert L.; Kantor, Paul; and Perry, Loren R., to Glonek, Robert L. Structural foam swimming pool wall and brace and method of erecting same. 4,548,005, Cl. 52-155.000.

Glucksman, Dov Z. Hair curling roller. 4,548,218, Cl. 132-39.000.

Goel, Anil B., to Ashland Oil, Inc. Cured polymeric material prepared by reacting an azadioxabicyclooctane with a polyisocyanate in the presence of moisture. 4,549,005, Cl. 528-53.000.

Goetter, Erwin H., to Preformed Line Products Company. Splice case. 4,549,040, Cl. 174-92.000.

Goetze AG: *See*—
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Golden Valley Foods Inc.: *See*—
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Goldstein, Albert: *See*—
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Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, 4,548,564, Cl. 425-32.000.

Gordon, Arnold Z., to Gould Inc. Electrochemical cell and method of passivating same. 4,548,878, Cl. 429-50.000.

Gordon, Philip: *See*—
Wadley, Donald K.; and Gordon, Philip, 4,548,134, Cl. 101-93.040.

Gordy, John, to New Fibers International. Nonsulfur chemimechanical pulping process. 4,548,675, Cl. 162-26.000.

Gorman, Michael W. Insulated liquid container. 4,548,339, Cl. 222-129.000.

Goshi, Hiroo: *See*—
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Goshima, Toshikazu: *See*—
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Gotch, Henry, to Grundy Dispense Systems, Inc. Containers for beverages. 4,548,343, Cl. 222-400.700.

Gottfried, Siegfried: *See*—
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Gordon, Arnold Z., 4,548,878, Cl. 429-50.000.

Goulet, Roger T.: *See*—
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Goyda, Michael A.: *See*—
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Graco Inc.: *See*—
Kelly, Lawrence S.; McCormick, Marty P.; and Weikel, William A., 4,548,652, Cl. 134-22.120.

Grady, John K.; and Rice, Richard E., to Grady, John K. X-Ray image converter system. 4,549,209, Cl. 358-111.000.

Graham Magnetics Incorporated: *See*—
States, Kenneth H.; and Smith, Walter W., 4,548,840, Cl. 427-365.000.

Graham, Stephen H., to Varian Associates, Inc. Hydraulic pulse dampener employing stiff diaphragm and nesting member. 4,548,240, Cl. 138-30.000.

Graindorge, Philippe: *See*—
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Rokunohe, Mitsuru; Nakajima, Toshiyuki; Iwata, Kansei; and Tajima, Hiroyuki, 4,549,175, Cl. 340-794.000.

Graver Company, The: *See*—
Kunin, Robert; and Salem, Eli, 4,548,717, Cl. 210-670.000.
Gray, Kenneth P.: *See*—
Greever, James E.; and Gray, Kenneth P., 4,547,952, Cl. 29-451.000.
Gray, Leslie M., III, to Airflow Research and Manufacturing Corp. Fan and housing. 4,548,548, Cl. 416-189.000.
Grazia, Gabrio: *See*—
Occhialini, Giorgio; Grazia, Gabrio; and Forlani, Fausto, 4,548,313, Cl. 198-430.000.
Green, Anthony W. Construction element. 4,548,590, Cl. 446-120.000.
Greenhouse, Robert: *See*—
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Greer, Marian B. Composite material. 4,548,851, Cl. 428-106.000.
Greever, James E.; and Gray, Kenneth P., to Carrier Corporation. Tube loading apparatus. 4,547,952, Cl. 29-451.000.
Grenier, Jodyne I.: *See*—
Middleton, Daryl J.; and Grenier, Jodyne I., 4,548,836, Cl. 427-160.000.
Grillo-Werke AG: *See*—
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Grimm, Dieter, to Degussa Aktiengesellschaft. Insulating housing for a surface temperature thermometer. 4,549,162, Cl. 338-28.000.
Groch, Mark W.; and Domnanovich, James R., to Siemens Gammasonics, Inc. Apparatus for monitoring cardiac activity via ECG and heart sound signals. 4,548,204, Cl. 128-700.000.
Grohe, Klaus: *See*—
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Gromelski, Stanley J., Jr.: *See*—
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Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., to Sensormatic Electronics Corporation. Coil assembly for substantially isotropic flux linkage in a given plane. 4,549,186, Cl. 343-748.000.
Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; and Maignan, Jean, 4,548,942, Cl. 514-301.000.
Gruber, Otto R.: *See*—
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Gruber, Peter: *See*—
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Grumman Aerospace Corporation: *See*—
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Grundy Dispense Systems, Inc.: *See*—
Gotch, Henry, 4,548,343, Cl. 222-400.700.
Grundy, Reed H., to PPG Industries, Inc. Tension measuring device and method for flexible linear material. 4,548,085, Cl. 73-862.480.
Grutter, Peter: *See*—
Renner, Alfred; Grutter, Peter; and Hugi, Rolf, 4,549,008, Cl. 528-220.000.
GTE Communication Systems Corporation: *See*—
Reimer, William A.; and Vonder, David L., 4,548,450, Cl. 339-17.00C.
GTE Laboratories Incorporated: *See*—
Lee, Kang I.; Jensen, William; and Cukor, Peter, 4,548,893, Cl. 430-296.000.
GTE Products Corporation: *See*—
Lester, James N., 4,549,178, Cl. 340-825.580.
Gualtieri, Peter J.; and Goulet, Roger T., to Cambridge Filter Corp. Downflow air filter construction and methods for air flow adjustment and leak testing thereof. 4,548,068, Cl. 73-40.700.
Guernet, Jacques: *See*—
Besson, Bernard; and Guernet, Jacques, 4,548,098, Cl. 74-687.000.
Guetlhuber, Friedrich: *See*—
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Guidelli, Rolando; and Foresti, Maria L., to Consiglio Nazionale Delle Ricerche. Hanging mercury drop electrode capable of automatic control. 4,548,679, Cl. 204-1.00T.
Guidoux, Loic B. Y., to Telecommunications Radioelectriques et Telephoniques. Arrangement for testing a device provided with an echo canceller. 4,549,049, Cl. 179-175.31E.
Guillien, Michel: *See*—
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Guillonneau, Claude: *See*—
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Gulf Oil Corporation: *See*—
York, Earl D.; Johnson, David M.; and Miller, Paul B., 4,548,702, Cl. 208-11.00R.
Gusic, Perry. Removable access door on bulk container having multiple layer walls. 4,548,351, Cl. 229-23.00R.
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Haab, Alvin D., to Brock Manufacturing, Inc. Bin ladder construction. 4,548,293, Cl. 182-99.000.
Haack, Brian P. Fraction indicator and method of use. 4,547,969, Cl. 33-138.000.
Haag, William G.: *See*—
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Hanke, Paul F.; and Hodson, Price R., to Alnor Instrument Company. Air flow volume measuring apparatus. 4,548,076, Cl. 73-202.000.
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Haase, Franklin D.: *See*—
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Habiger, Robert M., to Phillips Petroleum Company. Determination of oil shale yield from well log data. 4,548,071, Cl. 73-152.000.
Habu, Nobuo: *See*—
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Hagan Engineering, Inc.: *See*—
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Hagan, James C.; and Hagan, Owen C., to Hagan Engineering, Inc. Apparatus for filling containers with prescribed quantity of product by weight. 4,549,272, Cl. 364-478.000.
Hagan, Owen C.: *See*—
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Hageman, Larry H.; and Roy, Gerald A., Jr., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonylureas. 4,548,638, Cl. 71-93.000.
Hagglund, Tore; and Astrom, Karl J., to NAF Controls AB. Method and an apparatus in tuning a PID-regulator. 4,549,123, Cl. 318-610.000.
Haghiri-Tehrani, Yahya: *See*—
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Hagihara, Tatumi: *See*—
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Hahn, Roger S.: *See*—
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Hahnke, Manfred: *See*—
Bode, Albert; Chambers, Thomas V.; Hahnke, Manfred; and Kretzschmar, Wolfgang, 4,548,613, Cl. 8-638.000.
Halbach, Klaus, to United States of America, Energy. Permanent magnet multipole with adjustable strength. 4,549,155, Cl. 335-212.000.
Halczenko, Wasyl; and Hartman, George D., to Merck & Co., Inc. 1,5-Methano-1H-4-benzazonine dicarboxylates, process for preparing and use as calcium blockers. 4,548,941, Cl. 514-295.000.
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Haley, Robert G.: *See*—
Barnes, John M.; Haley, Robert G.; and Trepus, George E., Jr., 4,548,861, Cl. 428-322.700.
Hall, James R.; and Cunningham, Robert A., to Hughes Tool Company - USA. Tool joint with internal/external make-up shoulders. 4,548,431, Cl. 285-334.000.
Hall, John B.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Flavoring with tertiary pentamethylindanol derivatives. 4,548,821, Cl. 426-3.000.
Hamaguchi, Toshiaki: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.
Hamamoto, Hirofumi: *See*—
Osaki, Kazuhiko; Hamamoto, Hirofumi; Kurokawa, Junzi; and Akieda, Shigeru, 4,547,946, Cl. 29-412.000.
Hamamuro, Naozi: *See*—
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,548,882, Cl. 429-211.000.
Hambleton, Robert J., to AT&T Technologies, Inc. Plastic injector with heat control. 4,548,341, Cl. 222-146.600.
Hammann, Ingeborg: *See*—
Kruger, Bernd-Wieland; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,548,931, Cl. 514-141.000.
Hani, Kiyoshi: *See*—
Yamamoto, Sakuei; Nishida, Mitsuhiro; Inao, Hiroshi; Tashiro, Noboru; and Hani, Kiyoshi, 4,549,105, Cl. 310-87.000.
Hannen, Reiner W., to MSK-Verpackungs-Systeme Gesellschaft mit beschrankter Haftung. Burner for generation of a flow of hot gas, especially for shrinking plastic foils. 4,548,578, Cl. 431-350.000.
Hanscom, Bradford E.: *See*—
Mock, Gerald L.; and Hanscom, Bradford E., 4,549,046, Cl. 179-6.110.
Hansson, Borje; Johansson, Borje; and Pramskog, Torbjorn, to Forenade Fabriksverken. Mortar carriage. 4,548,122, Cl. 89-37.050.
Harada, Masasuke; and Moronaga, Yoshiharu, to Nippon Rubber Co., Ltd. Athletic shoe sole. 4,547,979, Cl. 36-30.00R.
Harada, Mineo; Simojyo, Tetuzi; and Furuya, Kaname, to Hitachi, Ltd. Print head for a dot matrix printer. 4,548,522, Cl. 400-124.000.
Harada, Naoki: *See*—
Kayane, Yutaka; and Harada, Naoki, 4,548,612, Cl. 8-524.000.

Hardee's Food Systems, Inc.: *See*—
Capo, James L.; and Cunningham, William D., 4,548,352, Cl. 229-17.00G.

Harder, Burkhard: *See*—
Knoblauch, Karl; Heimbach, Heinz; and Harder, Burkhard, 4,548,799, Cl. 423-351.000.

Harding, Bruce L., to Smith Valve Corporation. Top entry metal-seated ball valve. 4,548,384, Cl. 251-163.000.

Harris, Donald L., to Cordis Corporation. Implantable manually actuated medication dispensing system. 4,548,607, Cl. 604-891.000.

Harris Manufacturing Corporation: *See*—
Ruda, Jerome; and Ludwig, Vernon L., 4,548,294, Cl. 182-206.000.

Harry, Ieuan L.: *See*—
Piccioli, David P.; Harry, Ieuan L.; and Clark, Richard E., 4,549,066, Cl. 219-121.0LG.

Harsco Corporation: *See*—
Johnson, C. Donald, 4,548,229, Cl. 137-270.000.

Hartig, Klaus: *See*—
Dietrich, Anton; Hartig, Klaus; Lenz, Werner; and Scherer, Michael, 4,548,691, Cl. 204-192.00P.

Hartman, George D.: *See*—
Halczenko, Wasyl; and Hartman, George D., 4,548,941, Cl. 514-295.000.

Hartman, Richard B., to Minnesota Mining and Manufacturing Company. Flexible tape having bridges of electrically conductive particles extending across its pressure-sensitive adhesive layer. 4,548,862, Cl. 428-323.000.

Hartmann, Albert; Wacker, Oskar; Baschang, Gerhard; and Tarcsay, Lajos, to Ciba Geigy Corporation. Muramyl peptides and processes for their manufacture. 4,548,923, Cl. 514-8.000.

Hartwell Corporation: *See*—
Bourne, William R., 4,548,435, Cl. 292-229.000.

Hartz, James F., to General Motors Corporation. Plate separator. 4,548,306, Cl. 192-70.280.

Hasegawa, Kisaku, to Oil Drive Kogyo, Ltd. Hydraulic elevator. 4,548,296, Cl. 187-17.000.

Hasegawa, Masatake: *See*—
Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.

Hasegawa, Shunji: *See*—
Fukumura, Naoe; Hasegawa, Shunji; and Tanaka, Masanobu, 4,549,270, Cl. 364-474.000.

Hashimoto, Hiroshi; and Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Method for preparing a magnetic recording medium. 4,548,833, Cl. 427-44.000.

Hashimoto, Yoshitaka; and Eguchi, Takeo, to Sony Corporation. Method and apparatus for recording a digital information signal in parallel tracks on a record medium without guard bands between at least some adjacent tracks. 4,549,227, Cl. 358-328.000.

Hashiyama, Mitsuaki: *See*—
Nagata, Takayoshi; and Hashiyama, Mitsuaki, 4,548,980, Cl. 524-495.000.

Hasler, Rolf; and Palacin, Francis, to Sandoz Ltd. Method for determining the compatibility of a direct or reactive dyestuff with a polybasic amino compound. 4,548,902, Cl. 436-2.000.

Hata, Akio: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.

Hatakeyama, Kenji: *See*—
Kubotera, Hiroshi; Ogawa, Kenji; and Hatakeyama, Kenji, 4,548,537, Cl. 414-276.000.

Hatanaka, Koji; and Takizawa, Tozo, to Jidosha Kiki Co., Ltd. Glow plug for use in diesel engine. 4,549,071, Cl. 219-270.000.

Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, to Pioneer Electronic Corporation. System for recording and playing back information with magneto-optical disk memory using record and readout light beams of different wavelengths. 4,549,287, Cl. 369-45.000.

Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, to Mitsubishi Jukogyo K.K.; and Mitsubishi Mining and Cement Co., Ltd. Calcining apparatus for powdery materials. 4,548,580, Cl. 432-106.000.

Haubert, Steven D.; and Indrelunas, Stephen T., to Aeroquip Corporation. Crimped hose fitting. 4,548,430, Cl. 285-256.000.

Haugh, Granger. Microwave drying device and method. 4,549,053, Cl. 219-10.55M.

Hauni-Werke Korber & Co. KG.: *See*—
Adebahr, Klaus, 4,548,215, Cl. 131-84.400.
Kruse, Friedel, 4,548,019, Cl. 53-170.000.

Hawes, Samuel R.: *See*—
Brian, Dow V.; and Hawes, Samuel R., 4,549,047, Cl. 179-18.00B.

Hayakawa, Naoki: *See*—
Iwamoto, Tomiyuki; Hayakawa, Naoki; Honda, Haruo; and Maruyama, Teppei, 4,548,605, Cl. 604-410.000.

Hayama, Sadaji: *See*—
Watanabe, Koya; Yamazaki, Katuo; and Hayama, Sadaji, 4,548,532, Cl. 409-233.000.

Hayashi, Masakatsu; and Fujie, Kunio, to Hitachi, Ltd. Expansion valve. 4,548,047, Cl. 62-160.000.

Hayashi, Michiaki: *See*—
Banno, Tsutomu; Hayashi, Michiaki; and Senso, Hitoshi, 4,549,120, Cl. 318-254.000.

Hayashi, Motoshige; and Kobayashi, Toshiro, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method for production of thermoplastic resin foams. 4,548,775, Cl. 264-45.500.

Hayashi, Shozo: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,549,034, Cl. 17-17.0LF.

Hayashi, Takushi: *See*—
Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, 4,548,777, Cl. 264-107.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Operational mode responsive heating arrangement for internal combustion engine induction system. 4,548,183, Cl. 123-547.000.

Hayden, Owen, to National Nuclear Corporation Limited. Tube-in-shell heat exchangers. 4,547,944, Cl. 29-402.090.

Hayes Microcomputer Products, Inc.: *See*—
Heatherington, Dale A., 4,549,302, Cl. 375-8.000.

Haze, Setsuo: *See*—
Minamida, Kazukiyo; and Haze, Setsuo, 4,549,278, Cl. 364-567.000.

Heater, Charles P.; and Cooper, Bruce H., to Opelika Manufacturing Corp. Folder. 4,548,595, Cl. 493-458.000.

Heatherington, Dale A., to Hayes Microcomputer Products, Inc. Modem with improved escape sequence mechanism to prevent escape in response to random occurrence of escape character in transmitted data. 4,549,302, Cl. 375-8.000.

Hegadorn, Joseph L.: *See*—
Altares, Romulo A.; Gibson, David S.; Goyda, Michael A.; Hegadorn, Joseph L.; and Kapoor, Virendra N., 4,548,045, Cl. 62-63.000.

Hegg, Allan B.; and Phares, James S., to Century Boat Company. Boat including swim platform. 4,548,155, Cl. 114-362.000.

Heiart, Robert B., to Du Pont de Nemours, E. I., and Company. Registering and exposing sheet substrates using photosensitive liquid. 4,548,884, Cl. 430-22.000.

Heiber, Sonia J.: *See*—
Mueller, Karl F.; and Heiber, Sonia J., 4,548,990, Cl. 525-123.000.

Heidel, Jeffrey C.; Hoogervorst, Thomas R.; Lane, Lynn R.; and Swartz, Harold L., to Sperry Corporation. Tilt sensor and monitoring system. 4,547,972, Cl. 33-366.000.

Heider, Alfred; Schlick, Erich; and Schnall, Gunther, to AGFA-Gevaert Aktiengesellschaft. Apparatus for aligning sheets in a stack. 4,548,399, Cl. 271-221.000.

Heimbach, Heinz: *See*—
Knoblauch, Karl; Heimbach, Heinz; and Harder, Burkhard, 4,548,799, Cl. 423-351.000.

Heinrich, Josef: *See*—
Schwerdtel, Wulf; Lauer, Hubert; and Heinrich, Josef, 4,548,913, Cl. 502-68.000.

Heinrich, Volker: *See*—
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.

Heisler, Raymond A. Tray erecting apparatus with adjusting capability. 4,548,025, Cl. 53-580.000.

Held, Kurt. Device for application of surface pressure in dual belt presses. 4,548,133, Cl. 100-153.000.

Helenowski, Tomasz K. Sequential thermography fluid flow indicator. 4,548,516, Cl. 374-135.000.

Helix Collector Syndicate: *See*—
Naske, Marcel, 4,548,623, Cl. 55-233.000.

Heller, Rudolf; and Khan, Iwan, to Contraves AG. Method for mounting a radar reflector on an artillery shell. 4,547,949, Cl. 29-421.00E.

Helling, Gunter; and Himmelmann, Wolfgang, to AGFA-Gevaert A.G. Dye diffusion transfer process wherein proteolytic enzyme decomposes light sensitive element. 4,548,887, Cl. 430-213.000.

Hendricks, Charles D., to United States of America, Energy. Method to produce large, uniform hollow spherical shells. 4,548,767, Cl. 264-7.000.

Hendricks, Perry L. Adjustable self locking crow foot wrench. 4,548,104, Cl. 81-165.000.

Henk, Hermann: *See*—
Michna, Martin; and Henk, Hermann, 4,548,761, Cl. 260-508.000.

Henke, Arthur W.; and Antos, John M., to Thetford Corporation. Magnetically actuated level indicator. 4,547,916, Cl. 4-300.000.

Henkel KGaA: *See*—
Hoefer, Rainer; Meffert, Alfred; and Wegemund, Bernd, 4,549,002, Cl. 526-209.000.
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Guenther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,548,729, Cl. 252-174.210.

Hennessey, Richard G.: *See*—
Beemer, Richard B.; Hennessey, Richard G.; and Melles, Harold W., 4,548,303, Cl. 192-3.310.

Hepworth, Mathew A.: *See*—
Laflin, Philip; Eddleston, Ian; and Hepworth, Mathew A., 4,548,678, Cl. 162-146.000.

Herbert, Adolf; Anders, Dietmar; and Meier, Gunter, to Hermann Berstorff Maschinenbau GmbH. Extrusion head. 4,548,568, Cl. 425-131.100.

Herden, Werner. Spark plug for externally ignited internal combustion engine. 4,549,114, Cl. 315-58.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Herbert, Adolf; Anders, Dietmar; and Meier, Gunter, 4,548,568, Cl. 425-131.100.

Hermann C. Starck Berlin: *See—*
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,548,672, Cl. 156-646.000.
Hermens, Joannes L. G., to U.S. Philips Corporation. Multichannel X-ray detector with multiple electrical feedthrough members. 4,549,108, Cl. 313-93.000.
Hero, Richard A., to D G & Associates, Inc. Fishing appliance. 4,547,990, Cl. 43-15.000.
Herring, Robert B.: *See—*
Foster, Derrick W.; and Herring, Robert B., 4,548,159, Cl. 118-728.000.
Herzberg, Max; and Fish, Falk, to Orgenics Ltd. Modified sheet of material and method of making and using same in connection with biochemical procedures. 4,549,011, Cl. 536-31.000.
Herzer, Gerhard, to Erwin Sick GmbH Optik-Elektronik. Optical-electronic monitoring apparatus. 4,549,086, Cl. 250-561.000.
Hesse, Norbert: *See—*
Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,548,444, Cl. 299-34.000.
Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Adaptor assembly for Jerry cans and storage drums. 4,548,344, Cl. 222-464.000.
Hestehave, Kjeld: *See—*
Hestehave, Borge; and Hestehave, Kjeld, 4,548,344, Cl. 222-464.000.
Hester, Troy L.; Thompson, Steven J.; and Long, James R., to United States of America, Army. Dynamic alignment fixture. 4,547,974, Cl. 33-537.000.
Hettiger, James, to RCA Corporation. Trilevel sandcastle pulse encoding/decoding system. 4,549,202, Cl. 358-17.000.
Hettinger, William P.; and Beck, H. Wayne, to Ashland Oil, Inc. Microspherical catalysts. 4,548,912, Cl. 502-68.000.
Hevoyan, Varoujan H., to Chrisman, Timothy L. Sanitary scheduling device for dispenser closures. 4,548,157, Cl. 116-308.000.
Hewitt, Donald J.; and Becera, Juan O., to Hewitt Tubular Products, Inc. Tamper resistant container. 4,548,330, Cl. 220-210.000.
Hewitt Tubular Products, Inc.: *See—*
Hewitt, Donald J.; and Becera, Juan O., 4,548,330, Cl. 220-210.000.
Hewlett Packard Company: *See—*
Wadley, Donald K.; and Gordon, Philip, 4,548,134, Cl. 101-93.040.
Hicks, Irwin A.; and Ruddy, Donald C. Frangible seal coating and its method of production. 4,548,863, Cl. 428-325.000.
Higaki, Yuzo; and Ukai, Akitoshi, to Nisshin Oil Mills, Ltd., The. Polymeric glycol ester. 4,549,009, Cl. 528-301.000.
Higaki, Yuzo: *See—*
Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, 4,548,873, Cl. 428-695.000.
Higashi, Robert E.: *See—*
Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,548,078, Cl. 73-204.000.
Higgins, Harvey M., Jr.; Merkel, Kurt E.; and McCormick, Mack H., to Eli Lilly and Company. Antibiotic M43A, pharmaceutical composition and method of use. 4,548,925, Cl. 514-10.000.
Higuchi, Yoshiro: *See—*
Ito, Yasuro; Higuchi, Yoshiro; and Aida, Seiichi, 4,547,975, Cl. 34-8.000.
Hikita, Shigeyuki: *See—*
Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, 4,548,625, Cl. 55-282.000.
Hill, Alfred D.: *See—*
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., 4,548,272, Cl. 166-295.000.
Hill, Leslie C.: *See—*
McGhee, James B.; and Tweedie, Thomas D., 4,549,159, Cl. 337-301.000.
McGhee, James B., 4,549,160, Cl. 337-301.000.
Hilton-Davis Chemical Co., The: *See—*
Hung, William M., 4,549,192, Cl. 346-218.000.
Himmelmann, Wolfgang: *See—*
Helling, Gunter; and Himmelmann, Wolfgang, 4,548,887, Cl. 430-213.000.
Hincklieff, Ian R.: *See—*
Allen, Christopher M.; and Hincklieff, Ian R., 4,548,989, Cl. 525-101.000.
Hing, Samath; and Guillien, Michel, to Motorola, Inc. Regulator circuit. 4,549,129, Cl. 323-276.000.
Hinkel, Holger: *See—*
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.
Hinkhouse, Lysle R.: *See—*
Hulsebusch, William H.; and Hinkhouse, Lysle R., 4,547,920, Cl. 5-468.000.
Hinn, Werner, to RCA Corporation. Video signal DC restoration circuit. 4,549,214, Cl. 358-172.000.
Hintsa, Roy A., to Decoustics Limited. Concealed suspended ceiling system. 4,548,010, Cl. 52-484.000.
Hiraga, Masaharu; and Yoshii, Yuji, to Sanden Corporation. Scroll type fluid displacement apparatus with noncuniform scroll height. 4,548,555, Cl. 418-55.000.
Hirai, Syoichi: *See—*
Kobayashi, Tetuo; and Hirai, Syoichi, 4,547,993, Cl. 49-352.000.
Hirakawa, Manabu: *See—*
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,548,769, Cl. 264-22.000.
Hiramatsu, Yoshitada: *See—*
Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, 4,548,154, Cl. 114-355.000.
Hirano, Hideki: *See—*
Ayabe, Mitsukuni; Shimizui, Tunehiko; Kibayashi, Iwao; and Hirano, Hideki, 4,549,028, Cl. 548-308.000.
Hirauchi, Yukio, to Matsushita Electric Industrial Co. Ltd. Oil heating equipment. 4,548,575, Cl. 431-88.000.
Hirayama, Yoshio: *See—*
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,548,682, Cl. 204-35.100.
Hirose, Tomonao, to Kohshin Seimitsu Kikai Kabushiki Gaisha. Holder for detachably mounting a presser foot. 4,548,145, Cl. 112-240.000.
Hirota, Kazuo: *See—*
Akiba, Yutaka; and Hirota, Kazuo, 4,549,042, Cl. 174-114.00R.
Hirozawa, Stanley T.: *See—*
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., 4,548,787, Cl. 422-15.000.
Hirschberger, August: *See—*
Bienert, Horst; and Hirschberger, August, 4,548,439, Cl. 296-223.000.
Hirvikoski, Urpo: *See—*
Ylonen, Paavo; Hirvikoski, Urpo; Piippo, Esa; and Rajala, Pentti, 4,548,164, Cl. 123-2.000.
Hitachi Chemical Company, Ltd.: *See—*
Nakaso, Akishi; Yamanoi, Kiyoshi; Okamura, Toshiro; and Tsuru, Yoshiyuki, 4,548,644, Cl. 106-1.230.
Hitachi Denshi Kabushiki Kaisha Ltd.: *See—*
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.
Hitachi Engineering Co., Ltd.: *See—*
Honbu, Mitsuyuki; Matsuda, Yasuo; Suzuki, Katsunori; and Kajita, Yoshiki, 4,549,258, Cl. 363-71.000.
Hitachi, Ltd.: *See—*
Akiba, Yutaka; and Hirota, Kazuo, 4,549,042, Cl. 174-114.00R.
Harada, Mineo; Simojyo, Tetuzi; and Furuya, Kaname, 4,548,522, Cl. 400-124.000.
Hayashi, Masakatsu; and Fujie, Kunio, 4,548,047, Cl. 62-160.000.
Honbu, Mitsuyuki; Matsuda, Yasuo; Suzuki, Katsunori; and Kajita, Yoshiki, 4,549,258, Cl. 363-71.000.
Hotta, Masao; Maio, Kenji; and Nagaishi, Hiromi, 4,549,166, Cl. 340-347.0DA.
Ikuzaki, Kunihiko, 4,549,284, Cl. 365-222.000.
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.
Matsuoka, Shigeru; Yamauchi, Koji; Tadokoro, Hiroyuki; Yonekura, Seiji; and Suzuki, Mitsuo, 4,549,092, Cl. 307-116.000.
Nagae, Yoshiharu; and Kawakami, Hideaki, 4,548,474, Cl. 350-333.000.
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.
Ueda, Shigeta; Hombu, Mitsuyuki; and Matsuda, Yasuo, 4,549,259, Cl. 363-137.000.
Watari, Yoshio, 4,548,784, Cl. 376-216.000.
Yamagiwa, Tokio; Ishikawa, Toshio; Ozawa, Jun; Endo, Kaoru; and Hosokawa, Masao, 4,549,132, Cl. 324-54.000.
Yuki, Ikuo, 4,549,216, Cl. 358-242.000.
Hitachi Zosen Corporation: *See—*
Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, 4,548,154, Cl. 114-355.000.
Hiwada, Kunio: *See—*
Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, 4,548,926, Cl. 514-19.000.
Ho, Andrew W.: *See—*
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.
Hoai, Vong N.: *See—*
Lonchamp, Daniel; Hoai, Vong N.; and Navarre, Francois-Pierre, 4,548,615, Cl. 44-1.00D.
Hochstein, Peter A.: *See—*
Rozmus, Walter J.; and Hochstein, Peter A., 4,548,020, Cl. 53-268.000.
Hochstetler, Alan R., to Givaudan Corporation. Substituted tetrahydrofurans. 4,549,029, Cl. 549-429.000.
Hodges, Brian A., to Verbatim Corporation. Write protection device. 4,549,240, Cl. 360-133.000.
Hodson, Price R.: *See—*
Haake, Paul F.; and Hodson, Price R., 4,548,076, Cl. 73-202.000.
Hoechst Aktiengesellschaft: *See—*
Beck, Gerhard; Bartmann, Wilhelm; Knolle, Jochen; and Rupp, Richard H., 4,548,936, Cl. 514-422.000.
Brechlin, Alfred, 4,548,885, Cl. 430-49.000.
Kleiner, Hans-Jerg; and Dursch, Walter, 4,548,762, Cl. 260-543.00P.
Romeike, Arno; Regner, Richard; and Weinheimer, Alois, 4,547,932, Cl. 17-45.000.
Hoefer, Rainer; Meffert, Alfred; and Wegemund, Bernd, to Henkel KGaA. Emulsifiers for emulsion polymerization. 4,549,002, Cl. 526-209.000.

Hoeffken, Russell W., to Snyder General Corporation. Method of manufacturing a heat exchanger and plate assembly. 4,547,943, Cl. 29-157.30R.

Hoefman, Marc E. M., to International Standard Electric Corporation. Pulse corrector for phase comparator inputs. 4,549,148, Cl. 331-1.00A.

Hoetzl, Max, to Midland-Ross Corporation. Apparatus for cooling a strip prior to a minispangle operation. 4,548,052, Cl. 62-374.000.

Hoffacker, Bernhard: *See—*
Brandt, Jobst, 4,547,983, Cl. 36-131.000.

Hoffacker, Neal: *See—*
Brandt, Jobst, 4,547,983, Cl. 36-131.000.

Hoffe, Gerhard: *See—*
Stauder, Ernst; and Hoffe, Gerhard, 4,548,850, Cl. 428-88.000.

Hoffman, Edward C. Soap saving rack. 4,548,572, Cl. 425-410.000.

Hoffmann, Kurt, to Siemens Aktiengesellschaft. Monolithically integrated semiconductor circuit with transistors. 4,549,096, Cl. 307-297.000.

Hoffmann-La Roche Inc.: *See—*
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,548,750, Cl. 260-243.300.
Muller, Jean-Claude; and Ramuz, Henri, 4,549,019, Cl. 544-321.000.
Wick, Alexander E., 4,549,022, Cl. 546-193.000.

Hofmann, Hans P.: *See—*
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,548,933, Cl. 514-255.000.

Hofmann, Harald: *See—*
Hojer, Anke; Bockmann, Jurgen; Hofmann, Harald; Mikuteit, Axel; Ritter, Hans-Joachim; and Tenhagen, Rolf, 4,548,325, Cl. 211-69.500.

Hofmann, Karl; and Jager, Erich, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,548,356, Cl. 239-126.000.

Hohn, Bernd-Robert, to Audi NSU Auto Union AG. Transmission for motor vehicles. 4,548,100, Cl. 74-689.000.

Hojer, Anke; Bockmann, Jurgen; Hofmann, Harald; Mikuteit, Axel; Ritter, Hans-Joachim; and Tenhagen, Rolf, to Koh-I-Noor Rapidograph, Inc. Technical pen holder. 4,548,325, Cl. 211-69.500.

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Kobayashi, Koji; and Shimizu, Keisuke, 4,548,333, Cl. 220-276.000.

Holdredge, Ernest C., Jr., to Techplastics, Inc. Method and apparatus for molding structural foam articles. 4,548,776, Cl. 264-50.000.

Holland, Geoffrey J., to Crown Zellerbach Corporation. Subjecting film to corona discharge prior to compression rolling. 4,548,770, Cl. 264-22.000.

Hollandse Signaalapparaten B.V.: *See—*
Langeraar, Huibert B.; and Van Der Schoot, Alexander P. M., 4,549,286, Cl. 367-97.000.

Holm, Daniel R. Dual valve well pump installation. 4,548,552, Cl. 417-417.000.

Holmwood, Graham; Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Fungicidally active substituted 1-hydroxyethyl-triazolyl derivatives. 4,548,945, Cl. 514-383.000.

Holub, Fred: *See—*
Mellinger, Gary A.; Giles, Harold F., Jr.; Holub, Fred; and Schlich, William R., 4,548,997, Cl. 525-433.000.

Holzman, Thomas F.: *See—*
Baldwin, Thomas O.; and Holzman, Thomas F., 4,548,994, Cl. 525-329.900.

Hombu, Mitsuyuki: *See—*
Ueda, Shigeta; Hombu, Mitsuyuki; and Matsuda, Yasuo, 4,549,259, Cl. 363-137.000.

Homeyer, Bernhard: *See—*
Kruger, Bernd-Wieland; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,548,931, Cl. 514-141.000.

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Suzuki, Shintaro; Fujita, Hirotsugu; Asami, Yoshiaki; and Homma, Fumiko, 4,548,880, Cl. 429-162.000.

Honbu, Mitsuyuki; Matsuda, Yasuo; Suzuki, Katsunori; and Kajita, Yoshiki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Inverter device using gate turn-off thyristors. 4,549,258, Cl. 363-71.000.

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Ishikawa, Yoshikazu; and Kiuchi, Takeo, 4,548,181, Cl. 123-492.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao; and Sakai, Shinzou, 4,548,307, Cl. 192-0.076.
Ohhashi, Yasuo; Araki, Junichi; and Katsui, Yoshihiro, 4,548,592, Cl. 474-168.000.
Yabumoto, Toshio; Sakaoka, Hiromu; and Nakajima, Koji, 4,548,173, Cl. 123-308.000.
Yamato, Akihiro, 4,548,180, Cl. 123-478.000.

Honda, Haruo: *See—*
Iwamoto, Tomiyuki; Hayakawa, Naoki; Honda, Haruo; and Maruyama, Teppei, 4,548,605, Cl. 604-410.000.

Honda Motor Co., Ltd.: *See—*
Moro, Shuji; and Tenmaya, Michio, 4,548,483, Cl. 350-635.000.

Honda, Naojiro: *See—*
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,548,044, Cl. 62-48.000.

Honda, Yasuhisa; and Ando, Makoto, to Minolta Camera Kabushiki Kaisha. Conversion lens assembly for an automatic focusing system in a lens exchangeable camera. 4,548,488, Cl. 354-402.000.

Honeycutt, Thomas E.: *See—*
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,548,496, Cl. 356-213.000.

Honeywell Inc.: *See—*
Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,548,078, Cl. 73-204.000.
Jenekhe, Samson A.; and Fure, Barbara J., 4,548,738, Cl. 252-500.000.
Lerner, Edward M.; and Olson, Harold J., 4,549,274, Cl. 364-492.000.
Lo, Sau K.; and Peterson, Ronald E., 4,548,473, Cl. 350-311.000.
Thompson, Maynard L., 4,547,950, Cl. 29-445.000.

Honma, Kazuo: *See—*
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.

Hood, James H., Jr. Oil sampling system. 4,548,088, Cl. 73-864.340.

Hoogervorst, Thomas R.: *See—*
Heidel, Jeffrey C.; Hoogervorst, Thomas R.; Lane, Lynn R.; and Swartz, Harold L., 4,547,972, Cl. 33-366.000.

Hoppe, Axel: *See—*
Albrecht, Wolf-Wigand; Hoppe, Axel; Papp, Uwe; and Wolf, Rudiger, 4,548,672, Cl. 156-646.000.

Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation und Organisation mbH. Carrier element for IC-modules. 4,549,247, Cl. 361-398.000.

Hori, Masanori: *See—*
Terasaka, Yoshiyasu; Tanabe, Masao; and Hori, Masanori, 4,549,079, Cl. 250-339.000.

Horiba, Tamotsu: *See—*
Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, 4,548,625, Cl. 55-282.000.

Horiishi, Nanao: *See—*
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,548,801, Cl. 423-594.000.

Horikoshi, Yukio: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,548,558, Cl. 418-83.000.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Method for doping tin oxide. 4,548,741, Cl. 252-518.000.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Resistor compositions. 4,548,742, Cl. 252-519.000.

Horwitz, E. Philip; Kalina, Dale G.; Kaplan, Louis; and Mason, George W., to United States of America, Energy. Method for extracting lanthanides and actinides from acid solutions. 4,548,790, Cl. 423-9.000.

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Takahashi, Katsuhiro; Watanabe, Keiichi; Hoshihara, Naoto; and Jinbo, Hiroyuki, 4,548,835, Cl. 427-123.000.

Hosiden Electronics Co., Ltd.: *See—*
Amano, Katutoshi; and Kakuta, Toshio, 4,547,964, Cl. 29-883.000.
Ezure, Tadayoshi, 4,548,455, Cl. 339-45.00M.

Hosokawa, Masao: *See—*
Yamagiwa, Tokio; Ishikawa, Toshio; Ozawa, Jun; Endo, Kaoru; and Hosokawa, Masao, 4,549,132, Cl. 324-54.000.

Hotta, Masao; Maio, Kenji; and Nagaishi, Hiromi, to Hitachi, Ltd. Digital-to-analog converter using a feedback element matching technique. 4,549,166, Cl. 340-347.0DA.

Hough, Leslie; Phadnis, Shashikant P.; Khan, Riaz A.; and Jenner, Michael R., to Chemical Bank. Chloro-substituted sucrose compounds. 4,549,013, Cl. 536-122.000.

Howard Machinery Public Limited Company: *See—*
Linger, Barry A., 4,548,276, Cl. 172-166.000.

Howard, Robert; and Knoll, Jerry. Cash drop box having a plurality of compartments. 4,548,353, Cl. 232-4.00R.

Howard, Timothy L.: *See—*
Smith, Lawther O.; Howard, Timothy L.; and Kautz, Franz A., 4,548,389, Cl. 267-64.110.

Howarth, Thomas T.: *See—*
Ponsford, Roger J.; and Howarth, Thomas T., 4,548,815, Cl. 424-114.000.

Howe, Dennis L.: *See—*
Lowenhaupt, E. Harris; Litz, John E.; and Howe, Dennis L., 4,548,794, Cl. 423-123.000.

Howell, Frederick H., to Ciba-Geigy AG. Hydroquinone ether compounds. 4,549,015, Cl. 544-87.000.

Hsu, Wen Y. Collapsible camp stove. 4,548,192, Cl. 126-25.00R.

Huang, Jen-chi; Von Gruenberg, Gregory; and Riley, Donald J., to Polychrome Corp. Method of electrolytically graining a lithographic plate. 4,548,683, Cl. 204-129.400.

Huang, Jiann-Yu, to N. A. Taylor Company, Inc. Combined cigarette and chart/map lighter. 4,549,070, Cl. 219-269.000.

Huber, Bernhard; Tamm, Rolf G. A.; Tomoff, Toma; and Gonner, Winfried, to Bodenseewerk Perkin-Elmer & Co., GmbH. Method and device for introducing a sample into a graphite tube. 4,548,497, Cl. 356-312.000.

Huber, Gary D.: *See—*
Schneider, Jack H.; and Huber, Gary D., 4,549,266, Cl. 364-426.000.

Huber Italia S.R.L.: *See—*
Ruegg, Heinz, 4,548,059, Cl. 70-69.000.

Huber, Walter; and Zucker, Fritz, to ITT Industries, Inc. Electric motor housing with end cap. 4,548,334, Cl. 220-293.000.

Huck, William R., to Jim Walter Resources, Inc. Coal sampling device. 4,548,087, Cl. 73-863.570.

Hucke, Edward E., to Union Oil Company of California. Densified carbonaceous bodies with improved surface finishes. 4,548,957, Cl. 521-77.000.

Huel, Georges. Sign mounting system. 4,548,377, Cl. 248-219.100.

Huffman, Ronald F., to KV33 Corporation. Dental model articulator. 4,548,581, Cl. 433-64.000.
Hufford, Diane K., to United States of America, Air Force. VMJ Solar cell fabrication process using mask aligner. 4,547,958, Cl. 29-572.000.
Hughes Aircraft Company: *See—*
Assael, David; and Ruben, Lawrence M., 4,549,211, Cl. 358-126.000.
Hughes Tool Company: *See—*
Manderscheid, Phillip H., 4,548,264, Cl. 166-139.000.
Hughes Tool Company - USA: *See—*
Hall, James R.; and Cunningham, Robert A., 4,548,431, Cl. 285-334.000.
Hughson, Douglas, to Ford Motor Company. Helical gear pump with specific helix angle, tooth contact length and circular base pitch relationship. 4,548,562, Cl. 418-189.000.
Hugi, Rolf: *See—*
Renner, Alfred; Grutter, Peter; and Hugi, Rolf, 4,549,008, Cl. 528-220.000.
Huitema, Thomas W.; and DeSutter, David A., to J. I. Case Company. Handle control assembly. 4,548,094, Cl. 74-526.000.
Hull, Francis R. Condensing gas-to-gas heat exchanger. 4,548,262, Cl. 165-111.000.
Hulsebusch, William H.; and Hinkhouse, Lysle R., to Sears Manufacturing Company. Process for developing porosity in air impervious film and articles produced by the process. 4,547,920, Cl. 5-468.000.
Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., to Outokumpu Oy. Method for dispersing gas in a solid-containing liquid, and an apparatus for it. 4,548,765, Cl. 261-93.000.
Hung, William M., to Hilton-Davis Chemical Co., The. Electrochromic marking systems. 4,549,192, Cl. 346-218.000.
Hunter, Robert D.: *See—*
Carroll, Gary T.; and Hunter, Robert D., 4,549,264, Cl. 364-406.000.
Hurley, Kenneth L.: *See—*
Stirrat, John C.; Hurley, Kenneth L.; and Whittaker, Brian F., 4,548,490, Cl. 355-3.0DD.
Hurtz, Georg; and Vogts, Heinz P., to Wirth Maschinen-Und Bohrgerate-Fabrik GmbH. Method for sinking boreholes. 4,548,282, Cl. 175-61.000.
Hutchinson, Martin A.; Shaw, R. Howard; and Coad, George, to Varian Associates, Inc. Transfer plate rotation system. 4,548,699, Cl. 204-298.000.
Huther, Werner, to MTU Motorn-und Turbinen Union GmbH. Piston arrangement, particularly for an internal combustion engine. 4,548,125, Cl. 92-187.000.
Hwang, Yong Y., to Stein Associates, Inc. Food cooking oven and method. 4,548,191, Cl. 126-21.00A.
Hydro-Seal Valve Company, Inc.: *See—*
Cox, J. David, 4,548,067, Cl. 73-4.00R.
Hyman, Myles: *See—*
Sheehan, Ronald T.; and Hyman, Myles, 4,548,214, Cl. 130-27.0AE.
I.C.M. S.p.A. Italiana Costruzioni Metalmeccaniche: *See—*
Massimo, Bucefari; and Michele, Lazzarini, 4,548,031, Cl. 59-16.000.
I.P.C. Co., Ltd.: *See—*
Ichijo, Teruko, 4,548,603, Cl. 604-385.00R.
Iacovangelo, Charles D.; and Shores, David A., to United States of America, Energy. Electrolyte reservoir for carbonate fuel cells. 4,548,877, Cl. 429-41.000.
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. 3-Aminoindazole derivatives. 4,549,023, Cl. 546-199.000.
Icaro Olivieri & C.S.p.A.: *See—*
Olivieri, Oliviero, 4,547,980, Cl. 36-50.000.
Ichijo, Teruko, to I.P.C. Co., Ltd. Sanitary napkin. 4,548,603, Cl. 604-385.00R.
Ichikoh Industries Limited: *See—*
Moro, Shuji; and Tenmaya, Michio, 4,548,483, Cl. 350-635.000.
Ichimura, Akio: *See—*
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Ichimura, Akio, 4,549,271, Cl. 364-474.000.
Ideal Industries, Inc.: *See—*
Masheris, Fred; Michaels, Leonard H.; Scott, William J.; and Voss, Roy N., 4,549,038, Cl. 174-65.0SS.
Idemitsu Kosan Company Limited: *See—*
Iino, Mitsuaki; and Kanamori, Hideo, 4,548,226, Cl. 137-91.000.
Idemitsu Petrochemical Co., Ltd.: *See—*
Fujii, Atsushi, 4,548,778, Cl. 264-180.000.
Ife, Robert J., to Smith Kline & French Laboratories Limited. Pyridylaminoalkylaminopyrimidones useful as histamine H_1-antagonists. 4,548,940, Cl. 514-272.000.
Iga, Motoichi: *See—*
Nomaki, Koji; Mase, Hiroshi; Sato, Yasuo; and Iga, Motoichi, 4,548,636, Cl. 65-99.200.
Igarashi, Hitoshi: *See—*
Kamijo, Atsushi; and Igarashi, Hitoshi, 4,549,059, Cl. 219-56.210.
IHC Holland N.V.: *See—*
Roggeveen, Hans D. H., 4,548,147, Cl. 114-36.000.
Iida, Takenori: *See—*
Takai, Sakan; Iida, Takenori; and Kaneko, Keiichi, 4,549,282, Cl. 365-1.000.
Iino, Mitsuaki; and Kanamori, Hideo, to Idemitsu Kosan Company Limited. Apparatus for adjusting the concentration of oil in a water-containing oil material. 4,548,226, Cl. 137-91.000.
Ikari, Shinichi: *See—*
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,548,882, Cl. 429-211.000.
Ikeda, Kenjiro: *See—*
Ikeda, Yoshiyuki; Inoue, Atsuo; and Ikeda, Kenjiro, 4,548,660, Cl. 149-21.000.
Ikeda, Teppei: *See—*
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,869, Cl. 428-471.700.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,870, Cl. 428-474.700.
Ikeda, Yoshiyuki; Inoue, Atsuo; and Ikeda, Kenjiro, to Nippon Kayaku Kabushiki Kaisha. Water-in-oil emulsion explosive. 4,548,660, Cl. 149-21.000.
Ikuzaki, Kunihiko, to Hitachi, Ltd. Dynamic MOS random access memory. 4,549,284, Cl. 365-222.000.
Illetschko, Gerhard, to Robert Bosch GmbH. System for reduction of noise in a television signal. 4,549,213, Cl. 358-167.000.
Illinois Tool Works Inc.: *See—*
Weaver, William N., 4,548,317, Cl. 206-162.000.
Imada, Kiyoshi: *See—*
Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,548,867, Cl. 428-409.000.
Imazeki, Hiroyuki, to Futaba Denshi Kogyo K.K. Touch sensor. 4,547,971, Cl. 33-169.00R.
Immolding Establishment: *See—*
Morin, Claude P., 4,548,665, Cl. 156-197.000.
Imperial Chemical Industries: *See—*
Owen, David J.; and MacLaine, Colin G., 4,549,243, Cl. 361-228.000.
Imperial Chemical Industries, PLC: *See—*
Baker, Maurice G., 4,548,916, Cl. 502-105.000.
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,548,737, Cl. 252-500.000.
Williams, Ian G., 4,548,972, Cl. 524-100.000.
Inaba, Hajimu; and Sakakibara, Shinsuke, to Fanuc Ltd. Industrial robot control method. 4,549,276, Cl. 364-513.000.
Inagaki, Masaomi: *See—*
Teranishi, Hiroshi; Nakatsuyama, Takashi; and Inagaki, Masaomi, 4,549,233, Cl. 360-90.000.
Inao, Hiroshi: *See—*
Yamamoto, Sakuei; Nishida, Mitsuhiro; Inao, Hiroshi; Tashiro, Noboru; and Hani, Kiyoshi, 4,549,105, Cl. 310-87.000.
Inax Corporation: *See—*
Maeda, Hisashi, 4,548,008, Cl. 52-392.000.
Incorvia, Samuel A.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,548,322, Cl. 206-526.000.
Indrelunas, Stephen T.: *See—*
Haubert, Steven D.; and Indrelunas, Stephen T., 4,548,430, Cl. 285-256.000.
Infrared Industries, Inc.: *See—*
Baskins, Lowell L.; Keene, James M.; and Montfort, John G., 4,549,080, Cl. 250-343.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Fogaroli, Giuseppe; and Coli, Giuseppe, 4,549,222, Cl. 358-296.000.
Inmont Corporation: *See—*
Thiebaut, Bernard A., 4,548,645, Cl. 106-2.000.
Innertsberger, Ernst: *See—*
von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,549,004, Cl. 528-42.000.
Inoue, Atsuo: *See—*
Ikeda, Yoshiyuki; Inoue, Atsuo; and Ikeda, Kenjiro, 4,548,660, Cl. 149-21.000.
Inoue-Japax Research Inc.: *See—*
Inoue, Kiyoshi, 4,549,062, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Inc. Low-power availability protection for electrical machining apparatus. 4,549,062, Cl. 219-69.00W.
Inoue, Masao; Suzuki, Shingo; and Saito, Syozo, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,548,469, Cl. 350-128.000.
Inoue MTP Kabushiki Kaisha: *See—*
Kozuka, Masayoshi; Mizutani, Tomihiko; and Narita, Kohji, 4,548,843, Cl. 428-31.000.
Institut Elektrosvarki Imeni E. O. Patona: *See—*
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.
Institut Francais du Petrole: *See—*
Lonchamp, Daniel; Hoai, Vong N.; and Navarre, Francois-Pierre, 4,548,615, Cl. 44-1.00D.
Institute de Recherches de la Siderurgie Francaise (IRSID): *See—*
Motte, Jean-Pierre; and Maurer, Ghislain, 4,549,301, Cl. 373-108.000.
Inter-Ikea AG: *See—*
Lundgren, Gillis, 4,548,295, Cl. 186-63.000.
International Business Machines Corporation: *See—*
Axmear, Frederick E.; and Collins, David W., 4,549,232, Cl. 360-77.000.
Benarr, Garry M.; Burns, Terry A.; and Walker, William J., 4,548,451, Cl. 339-17.00M.
Castel, Rene; Dalboussiere, Gerard; and Kulakowski, Michel, 4,549,296, Cl. 371-16.000.

Cato, Robert T.; Dickson, LeRoy D.; and Stokes, Olen L., Jr., 4,548,463, Cl. 350-3.710.
Cole, Terence G.; and West, Roderick M., 4,549,118, Cl. 315-393.000.
Dobberstein, Edward A., 4,549,130, Cl. 323-308.000.
Ecker, Mario E.; and Olson, Leonard T., 4,549,200, Cl. 357-80.000.
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.
Gillett, John B., 4,548,452, Cl. 339-17.00R.
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International Flavors & Fragrances Inc.: *See—*
Hall, John B.; and Yoshida, Takao, 4,548,821, Cl. 426-3.000.
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,548,764, Cl. 261-75.000.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,548,743, Cl. 252-522.00R.

International Food Equipment Inc.: *See—*
Verkler, Charles E., 4,548,508, Cl. 366-195.000.

International Paper Company: *See—*
Capo, James L.; and Cunningham, William D., 4,548,352, Cl. 229-17.00G.

International Standard Electric Corporation: *See—*
Hoefman, Marc E. M., 4,549,148, Cl. 331-1.00A.

InterNorth, Inc.: *See—*
Dickey, Leland C., 4,548,802, Cl. 423-659.000.
Dickey, Leland C., 4,548,803, Cl. 423-659.000.

Interox (Societe Anonyme): *See—*
Hageman, Jacques; and Meyers, Liliane, 4,548,674, Cl. 162-5.000.

Intevep, S.A.: *See—*
Rodriguez, Domingo; Schemel, Roberto; and Salazar, Ramon, 4,548,792, Cl. 423-65.000.

Iozza, Emanuele. Maritime transportation and distribution system and method for bulk raw materials. 4,548,152, Cl. 114-260.000.

IRECO Incorporated: *See—*
Jessop, Harvey A., 4,548,659, Cl. 149-18.000.

Ireland, Donald T., to Cargill, Incorporated. Solvent precipitation of salt. 4,548,614, Cl. 23-300.000.

Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of loading green tires. 4,548,781, Cl. 264-315.000.

Irisawa, Naoshi, to TDK Electronics Co., Ltd. Dielectric ceramic of $BaO\text{-}TiO_2$ and SnO_2. 4,548,910, Cl. 501-137.000.

Irvin, Howard B.: *See—*
Clark, Earl, Jr.; and Irvin, Howard B., 4,548,982, Cl. 524-556.000.

Irvine, Robert; O'Brien, John G.; and Luperti, Harry E., to Pitney Bowes Inc. Inserter feeder document stop. 4,548,393, Cl. 270-59.000.

Irving, Edward; and Smith, Terence J., to Ciba Geigy Corporation. Process for the production of images using a heating step prior to imaging. 4,548,895, Cl. 430-325.000.

Isaman, David L.; Perloff, Ronald S.; and Tomlinson, Christopher J., to Burroughs Corporation. Method of efficiently and simultaneously transmitting both isochronous and nonisochronous data in a computer network. 4,549,292, Cl. 370-89.000.

Isett, Donald D.: *See—*
Martell, Charles R.; Isett, Donald D.; and Treadwell, Stephen S., 4,548,143, Cl. 112-121.110.

Ishibashi, Shizuka: *See—*
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.

Ishida, Takashi; Shimizu, Kenshi; and Kamiyama, Shuichi, to Mikuni Kogyo Co., Ltd. Rotating mechanism of throttle valve for fuel supply device of internal combustion engine. 4,548,176, Cl. 123-342.000.

Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Exhaust gas cleaning device for diesel engines. 4,548,625, Cl. 55-282.000.

Ishiguro, Kuniaki: *See—*
Matsui, Toshio; Doi, Yasuhiro; Kinoshita, Keichi; and Ishiguro, Kuniaki, 4,548,403, Cl. 271-296.000.

Ishikawa, Toshio: *See—*
Yamagiwa, Tokio; Ishikawa, Toshio; Ozawa, Jun; Endo, Kaoru; and Hosokawa, Masao, 4,549,132, Cl. 324-54.000.

Ishikawa, Yoshikazu; and Kiuchi, Takeo, to Honda Giken Kogyo K.K. Method of controlling the fuel supply to an internal combustion engine at acceleration. 4,548,181, Cl. 123-492.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Suzuki, Ryushi; and Yamaga, Joji, 4,548,622, Cl. 55-204.000.

Ishitobi, Hirotake: *See—*
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Ishizaka, Takao: *See—*
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Istituto de Angeli S.p.A.: *See—*
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.

Ito, Akira: *See—*
Yagitani, Takayuki; Matsui, Hiromasa; Ito, Akira; and Ueno, Toshishige, 4,548,745, Cl. 252-567.000.

Ito, Hiroshi: *See—*
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,548,101, Cl. 74-720.000.

Ito, Katsumi: *See—*
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,548,932, Cl. 514-211.000.

Ito, Yasuro; Higuchi, Yoshiro; and Aida, Seiichi, to Ito, Yasuro; and Taisei Corporation. Method and apparatus for adjusting the quantity of water deposited on a fine aggregate. 4,547,975, Cl. 34-8.000.

Itoh, Tatsuo: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.

ITT Industries, Inc.: *See—*
Biedka, Ryszard, 4,548,630, Cl. 65-2.000.
Huber, Walter; and Zucker, Fritz, 4,548,334, Cl. 220-293.000.

Ivantsov, Oleg M.: *See—*
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Ive, John G. S.: *See—*
Creed, David M.; and Ive, John G. S., 4,549,298, Cl. 371-40.000.

Iwamoto, Taro: *See—*
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.

Iwamoto, Tomiyuki; Hayakawa, Naoki; Honda, Haruo; and Maruyama, Teppei, to Terumo Kabushiki Kaisha. Method for manufacturing plastic container containing infusion solution which does not allow deterioration of infusion solution for long period of time. 4,548,605, Cl. 604-410.000.

Iwamura, Junichi, to Tokiwa Kanpo Pharmaceutical Co., Ltd. Acid and alkali insoluble food component from leguminous plants. 4,548,831, Cl. 426-634.000.

Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Kawamura, Kouichi, to Fuji Photo Film Co., Ltd. Photopolymerizable composition containing acylhaloacetic acid amide derivatives. 4,548,892, Cl. 430-288.000.

Iwata, Kansei: *See—*
Rokunohe, Mitsuru; Nakajima, Toshiyuki; Iwata, Kansei; and Tajima, Hiroyuki, 4,549,175, Cl. 340-794.000.

Izumi, Toshiaki: *See—*
Nakayama, Masatoshi; and Izumi, Toshiaki, 4,548,864, Cl. 428-336.000.

J. I. Case Company: *See—*
Beemer, Richard B.; Hennessey, Richard G.; and Melles, Harold W., 4,548,303, Cl. 192-3.310.
Huitema, Thomas W.; and DeSutter, David A., 4,548,094, Cl. 74-526.000.

J-Jet Konstruktions: *See—*
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,548,187, Cl. 123-557.000.

Jacobs, John W.: *See—*
Snellman, Donald L.; Pearson, Bernard A.; and Jacobs, John W., 4,548,395, Cl. 271-11.000.

Jaffe, Edward E., to Ciba Geigy Corporation. Manufacture of resin extended pigments. 4,548,968, Cl. 524-88.000.

Jager, Erich: *See—*
Hofmann, Karl; and Jager, Erich, 4,548,356, Cl. 239-126.000.

Jagst, Peter, to Trutzschler GmbH & Co. KG. Waste grid for a textile fiber processing machine. 4,547,935, Cl. 19-93.000.

Janczak, Jerzy. Hydraulic pump or motor with interchangeable gears. 4,548,557, Cl. 418-76.000.

Janssen, Karl-Egon; and Breur, Heinz G., to Rheinmetall GmbH. Breech mechanism with a mushroom head packing. 4,548,121, Cl. 89-26.000.

Janssen Pharmaceutica N. V.: *See—*
Kennis, Ludo E. J.; Vandenberk, Jan; and Boey, Jozef M., 4,548,939, Cl. 514-265.000.

Janssen Pharmaceutica N.V.: *See—*
Kennis, Ludo E. J.; and Mertens, Josephus C., 4,548,938, Cl. 514-258.000.

Japan Life Co., Ltd.: *See—*
Shibata, Yoshikazu, 4,548,156, Cl. 116-70.000.

Japan Tobacco & Salt Public Corporation, The: *See—*
Nagashino, Ayaji, 4,548,539, Cl. 414-412.000.

Jarog, Dean J.: *See—*
Regunathan, Perialwar; Tadlock, John W.; and Jarog, Dean J., 4,548,227, Cl. 137-268.000.

Jenekhe, Samson A.; and Fure, Barbara J., to Honeywell Inc. Electrically conducting complexes of poly (3,6-N-alkylcarbazolyl alkenes) and method of making. 4,548,738, Cl. 252-500.000.

Jenner, Michael R.: *See—*
Hough, Leslie; Phadnis, Shashikant P.; Khan, Riaz A.; and Jenner, Michael R., 4,549,013, Cl. 536-122.000.

Jensen, William: *See—*
Lee, Kang I.; Jensen, William; and Cukor, Peter, 4,548,893, Cl. 430-296.000.

Jessop, Harvey A., to IRECO Incorporated. Cast emulsion explosive composition. 4,548,659, Cl. 149-18.000.

Jidosha Kiki Co., Ltd.: *See—*
Hatanaka, Koji; and Takizawa, Tozo, 4,549,071, Cl. 219-270.000.

Jim Walter Resources, Inc.: *See—*
Huck, William R., 4,548,087, Cl. 73-863.570.

Jinbo, Hiroyuki: *See—*
Takahashi, Katsuhiro; Watanabe, Keiichi; Hoshihara, Naoto; and Jinbo, Hiroyuki, 4,548,835, Cl. 427-123.000.

Job, Robert C.: *See—*
Goodall, Brian L.; and Job, Robert C., 4,548,915, Cl. 502-104.000.

Johannesburg Consolidated Investment Company Limited: *See*—
Muir, Colin W. A., 4,548,718, Cl. 210-719.000.

Johanson, Edward W.; and August, Charles, to United States of America, Energy. Method and apparatus for measuring response time. 4,548,513, Cl. 368-9.000.

Johansson, Borje: *See*—
Eriksson, Sune; Johansson, Borje; and Santen, Sven, 4,548,621, Cl. 55-72.000.
Hansson, Borje; Johansson, Borje; and Pramskog, Torbjorn, 4,548,122, Cl. 89-37.050.

Johansson, Kurt A.; and Marcusson, John-Eric, to Alnova Bygg Aktiebolag. Prefabricated balcony platform. 4,548,003, Cl. 52-73.000.

John, Heinrich R.; and Munk, Ulrich B., to AMP Incorporated. Connector having improved contact retainers. 4,548,461, Cl. 339-217.00R.

Johnson, C. Donald, to Harsco Corporation. Open-closed center hydraulic valve assembly. 4,548,229, Cl. 137-270.000.

Johnson, David M.: *See*—
York, Earl D.; Johnson, David M.; and Miller, Paul B., 4,548,702, Cl. 208-11.00R.

Johnson, Lars Goran I.: *See*—
Folestad, Sven S.; Galle, Bo G.; Johnson, Lars Goran I.; and Josefsson, Bjorn O., 4,548,498, Cl. 356-318.000.

Johnson, Robert G.: *See*—
Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,548,078, Cl. 73-204.000.

Johnson, Robert L.: *See*—
Roberts, Jack; and Johnson, Robert L., 4,547,910, Cl. 623-18.000.

Johnson, Susan L.: *See*—
Parsons, Robert E.; Westcott, Martha L.; and Johnson, Susan L., 4,548,845, Cl. 428-40.000.

Johnson, Warren F.: *See*—
Stowe, Lawrence R.; and Johnson, Warren F., 4,548,252, Cl. 166-299.000.

Johnstone, Norman E.; and Kehoe, John R., to United States Gypsum Company. Paper having calcium sulfate mineral filler for use in the production of gypsum wallboard. 4,548,676, Cl. 162-135.000.

Johs. Girmes & Co. AG: *See*—
Stauder, Ernst; and Hoffe, Gerhard, 4,548,850, Cl. 428-88.000.

Jones, Walton B.: *See*—
Kriebel, John E.; and Jones, Walton B., 4,548,359, Cl. 239-434.000.

Jonke, Gerhard: *See*—
Steinmann, Peter; Engel, Reinhard; Parstorfer, Richard; Brugger, Rudolf; and Jonke, Gerhard, 4,548,669, Cl. 156-358.000.

Josefsson, Bjorn O.: *See*—
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Joy Manufacturing Company: *See*—
Slagle, Richard M., 4,549,119, Cl. 318-11.000.

Junker, Erwin. Method for producing threaded sections of threading tools. 4,548,000, Cl. 51-288.000.

Junkosha Company Ltd.: *See*—
Akiba, Juji; Kobayashi, Satoru; and Sugibuchi, Hiroyuki, 4,549,171, Cl. 340-605.000.

Justice, David D.: *See*—
Kadija, Igor V.; and Justice, David D., 4,548,693, Cl. 204-252.000.

Kabushiki Kaisha Chubu Netsuren Kenkyusho: *See*—
Shiga, Tokio; and Saida, Keiichi, 4,548,536, Cl. 414-225.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Minamida, Kazukiyo; and Haze, Setsuo, 4,549,278, Cl. 364-567.000.
Sashiki, Takashi; and Sakaeda, Keiko, 4,548,286, Cl. 177-1.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Matsuda, Kazuo; and Morita, Koichi, 4,548,036, Cl. 60-464.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yabe, Hiroshi, 4,548,511, Cl. 368-10.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, 4,548,625, Cl. 55-282.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Araki, Hidefiro; Nakane, Katsumi; and Otani, Susumu, 4,548,029, Cl. 57-267.000.

Kadija, Igor V.; and Justice, David D., to Olin Corporation. Reticulate electrode for electrolytic cells. 4,548,693, Cl. 204-252.000.

Kageyama, Koji: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.

Kageyama, Takafumi: *See*—
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, 4,548,617, Cl. 51-293.000.

Kageyama, Takashi: *See*—
Yoshino, Tetsuya; Kageyama, Takashi; Kato, Kazuo; and Kishido, Takeshi, 4,548,837, Cl. 427-209.000.

Kaiser, Wolfgang: *See*—
von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,549,004, Cl. 528-42.000.

Kajima Corporation: *See*—
Kubotera, Hiroshi; Ogawa, Kenji; and Hatakeyama, Kenji, 4,548,537, Cl. 414-276.000.

Kajita, Yoshiki: *See*—
Honbu, Mitsuyuki; Matsuda, Yasuo; Suzuki, Katsunori; and Kajita, Yoshiki, 4,549,258, Cl. 363-71.000.

Kajiyama, Keiichi, to Disco Abrasive Systems, Ltd. Electrodeposited grinding tool. 4,547,998, Cl. 51-206.00R.

Kajiyama, Takashi: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,548,682, Cl. 204-35.100.

Kakizawa, Toshio: *See*—
Okatsuka, Hisashi; Taniguchi, Koichi; and Kakizawa, Toshio, 4,549,056, Cl. 219-10.770.

Kakuta, Toshio: *See*—
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Kal Tool Engineering: *See*—
Badalamenti, Vito; and Weller, Nicholas J., 4,548,574, Cl. 425-531.000.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.

Kalina, Alexander I. Method of generating energy. 4,548,043, Cl. 60-673.000.

Kalina, Dale G.: *See*—
Horwitz, E. Philip; Kalina, Dale G.; Kaplan, Louis; and Mason, George W., 4,548,790, Cl. 423-9.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Beier, Stefan, 4,549,124, Cl. 318-663.000.

Kalubowila, Prematilaka W.; Wach, Stanislaw P.; and Levens, Michael B., to Shell Oil Company. Electronic conductor and a method of manufacturing it. 4,549,043, Cl. 174-133.00R.

Kameda, Naomi, to Sclavo, Inc. Competitive immunofluorescence assay and test kit. 4,548,908, Cl. 436-500.000.

Kamei, Sakito: *See*—
Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, 4,548,154, Cl. 114-355.000.

Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, to Hitachi, Ltd. Picture processing apparatus. 4,549,208, Cl. 358-108.000.

Kamijo, Atsushi; and Igarashi, Hitoshi, to NEC Corporation. Wire bonder with controlled atmosphere. 4,549,059, Cl. 219-56.210.

Kamiyama, Shuichi: *See*—
Ishida, Takashi; Shimizu, Kenshi; and Kamiyama, Shuichi, 4,548,176, Cl. 123-342.000.

Kamleitner, Ewald, to MTU Friedrichshafen GmbH. Timing device. 4,548,182, Cl. 123-501.000.

Kampmann, Harry, to Steag AG. Device for measuring the temperature in a dust carrying gas stream. 4,548,517, Cl. 374-143.000.

Kanamori, Hideo: *See*—
Iino, Mitsuaki; and Kanamori, Hideo, 4,548,226, Cl. 137-91.000.

Kanao, Mitsuhiro. Seal system in rotary engine. 4,548,560, Cl. 418-144.000.

Kanaoka, Takeshi; Nakamura, Katutoshi; and Shimizu, Shigehisa, to Fuji Photo Film Co., Ltd. Side printing apparatus. 4,548,492, Cl. 355-50.000.

Kanebo, Ltd.: *See*—
Nishida, Takeshi; Yamagami, Yousuke; Takeda, Toshihide; and Saito, Toshio, 4,547,906, Cl. 2-93.000.

Kaneko, Keiichi: *See*—
Takai, Sakan; Iida, Takenori; and Kaneko, Keiichi, 4,549,282, Cl. 365-1.000.

Kaneko, Nagao; Fujimori, Yoshinori; Shimizu, Seizaburo; and Obara, Shin, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic beam focusing device with a concave surface. 4,549,107, Cl. 310-327.000.

Kaneko, Syuzo, to Canon Kabushiki Kaisha. Time-sharing driving method for ferroelectric liquid crystal display. 4,548,476, Cl. 350-350.00S.

Kaneko, Takashi, to Nippon Electric Co., Ltd. Pulse width modulator circuit with thermal breakdown prevention. 4,549,151, Cl. 332-9.00R.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,547,982, Cl. 36-114.000.

Kantor, Paul: *See*—
Glonek, Robert L.; Kantor, Paul; and Perry, Loren R., 4,548,005, Cl. 52-155.000.

Kaplan, Louis: *See*—
Horwitz, E. Philip; Kalina, Dale G.; Kaplan, Louis; and Mason, George W., 4,548,790, Cl. 423-9.000.

Kapoor, Virendra N.: *See*—
Altares, Romulo A.; Gibson, David S.; Goyda, Michael A.; Hegadorn, Joseph L.; and Kapoor, Virendra N., 4,548,045, Cl. 62-63.000.

Karlsson, Bengt. Catching hook. 4,547,989, Cl. 43-5.000.

Karlsson, Peter; and Palmaer, Leif. Cap arrangement. 4,547,908, Cl. 2-424.000.

Karol, Thomas J.; Sung, Rodney L.; and Kaufman, Benjamin J., to Texaco Inc. Succinimide derivatives as additives in lubricating oils. 4,548,724, Cl. 252-51.50A.

Karpati, Egon: *See*—
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.

Kastel, Walter, to Endress U. Hauser GmbH u. Co. Deflecting spring. 4,548,086, Cl. 73-862.650.

Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Radiation sensitive organic thin film comprising an azulenium salt. 4,548,886, Cl. 430-70.000.

Katagiri, Masayoshi: *See*—
Nomura, Yoshihisa; Katagiri, Masayoshi; and Sakakibara, Shigemi, 4,548,093, Cl. 74-512.000.

Kataoka, Kiroyuki, to Fuji Xerox Co., Ltd. Slip processing system. 4,549,077, Cl. 235-384.000.

Katila, Michael J.: *See*—
Chazan, David; and Katila, Michael J., 4,548,662, Cl. 156-86.000.
Kato, Kazuo: *See*—
Yoshino, Tetsuya; Kageyama, Takashi; Kato, Kazuo; and Kishido, Takeshi, 4,548,837, Cl. 427-209.000.
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; and Takeuchi, Kousou, to Matsushita Electric Industrial Co., Ltd. Method of encoding and decoding binary data. 4,549,167, Cl. 340-347.0DD.
Kato, Shigeru: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,549,287, Cl. 369-45.000.
Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; and Kiuchi, Tsutomu, 4,549,201, Cl. 358-13.000.
Katoh, Katsunori: *See*—
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Katoh, Mitsumi: *See*—
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Katsui, Yoshihiro: *See*—
Ohhashi, Yasuo; Araki, Junichi; and Katsui, Yoshihiro, 4,548,592, Cl. 474-168.000.
Katsuyama, Harumi: *See*—
Sekikawa, Nobuyoshi; Katsuyama, Harumi; and Kondo, Asaji, 4,548,906, Cl. 436-113.000.
Katz, Murray; and Schroll, Craig R., to United States of America, Energy. Short protection device for stack of electrolytic cells. 4,548,874, Cl. 429-18.000.
Katz, Saul N.; Proscia, George E.; and Clisura, George L., to General Foods Corporation. Separate recovery of caffeine and coffee solids adsorbed on activated carbon. 4,548,827, Cl. 426-427.000.
Kaufman, Benjamin J.: *See*—
Karol, Thomas J.; Sung, Rodney L.; and Kaufman, Benjamin J., 4,548,724, Cl. 252-51.50A.
Kaufman, Lazar. Security device for preventing separation of a lock from a door. 4,548,062, Cl. 70-417.000.
Kaus, Gerhard: *See*—
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.
Kauth, William: *See*—
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Kautz, Franz A.: *See*—
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Kaveckas, Edward J.: *See*—
Seitelman, Leon H.; and Kaveckas, Edward J., 4,548,531, Cl. 409-9.000.
Kawagoe, Takashi: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,547,955, Cl. 29-568.000.
Kawai, Shigeyuki: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.
Kawai, Taiyo; Habu, Nobuo; and Matsumoto, Shinichi, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with two intake valves. 4,548,175, Cl. 123-308.000.
Kawajiri, Yoshio, to Ricoh Company, Ltd. Head carriage for use in a magnetic recording machine. 4,549,239, Cl. 360-105.000.
Kawakami, Hideaki: *See*—
Nagae, Yoshiharu; and Kawakami, Hideaki, 4,548,474, Cl. 350-333.000.
Kawakami, Shigenobu: *See*—
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Kawakubo, Hiromu: *See*—
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Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Surface smoothing method for magnetic recording medium. 4,548,772, Cl. 264-26.000.
Kawamoto, Mutsumi: *See*—
Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,548,099, Cl. 74-689.000.
Kawamura, Kouichi: *See*—
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Kawasaki Jukogyo Kabushiki Kaisha: *See*—
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Kawasaki, Shunzo: *See*—
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Kawasaki Steel Corporation: *See*—
Yonezawa, Kazuma; Tanda, Toshikuni; and Ishitobi, Hirotake, 4,548,868, Cl. 428-446.000.
Kay, Ronald D. Latch mechanism. 4,548,433, Cl. 292-49.000.
Kayane, Yutaka; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Halo-triazine and vinylsulfone reactive dye composition with buffer for storage stability. 4,548,612, Cl. 8-524.000.
Keene, James M.: *See*—
Baskins, Lowell L.; Keene, James M.; and Montfort, John G., 4,549,080, Cl. 250-343.000.
Kehoe, John R.: *See*—
Johnstone, Norman E.; and Kehoe, John R., 4,548,676, Cl. 162-135.000.
Keller, Stuart R., to Exxon Production Research Co. Oscillatory flow method for improved well cementing. 4,548,271, Cl. 166-291.000.
Kelly, Lawrence S.; McCormick, Marty P.; and Weikel, William A., to Graco Inc. Method of purging a plural component mixing and dispensing system. 4,548,652, Cl. 134-22.120.
Kelly, Linda. Teaching aid for mathematics. 4,548,585, Cl. 434-195.000.
Kelmar Marine Inc.: *See*—
Moura, Michael; Gonsalves, Lenine; and Fain, Gilbert, 4,549,169, Cl. 340-539.000.
Kelsey-Hayes Company: *See*—
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Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.
Kenjo, Hideki: *See*—
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Kennis, Ludo E. J.; and Mertens, Josephus C., to Janssen Pharmaceutica N.V. 5-H-1,3,4-thiadiazolo[3,2-a]pyrimidin-5-one compounds. 4,548,938, Cl. 514-258.000.
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Kensrue, Milo M. Welding torch having swivel head assembly. 4,549,068, Cl. 219-137.630.
Kent, Stephen B. H.; and L'Italien, James J., to Molecular Genetics Research & Development. Protein sequencing method. 4,548,904, Cl. 436-89.000.
Kern, Gilbert G. Roller tray with cover. 4,547,926, Cl. 15-257.060.
Kern, Manfred: *See*—
Staudenrausch, Georg; Abt, Franz; Kern, Manfred; and Zinser, Georg, 4,547,931, Cl. 17-1.00F.
Key Engineering, Inc.: *See*—
Albiol, Ignacio B., 4,548,620, Cl. 55-48.000.
Khan, Iwan: *See*—
Heller, Rudolf; and Khan, Iwan, 4,547,949, Cl. 29-421.00E.
Khan, Riaz A.: *See*—
Hough, Leslie; Phadnis, Shashikant P.; Khan, Riaz A.; and Jenner, Michael R., 4,549,013, Cl. 536-122.000.
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Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., 4,549,241, Cl. 361-45.000.
Kietzman, John H., to Manville Service Corporation. Diatomite-modified asphalt membranes and slurry seals. 4,548,650, Cl. 106-281.00R.
Kilkelly, John, to Clairson International Corporation. Pole assembly for installing closet shelves. 4,548,327, Cl. 211-187.000.
Kimball, Spencer D.; Kronenthal, David; and Koster, William H., to E. R. Squibb & Sons, Inc. (2-Oxo-1-azetidinyloxy)-2-propenoic acid. 4,548,751, Cl. 260-245.400.
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Aberson, Gerard M.; and Ring, Gerard J. F., 4,548,847, Cl. 428-74.000.
Ali Khan, Mir I.; and Schmidt, Richard J., 4,548,856, Cl. 428-171.000.
Kimmelaar, Rudolf J. A.; and Smits, Cornelis A., to Cincinnati Milacron Inc. Adjustable tool mount. 4,547,997, Cl. 51-168.000.
Kimmon Manufacturing Co., Inc.: *See*—
Onoda, Hajime; and Arakawa, Kunio, 4,548,084, Cl. 73-861.810.
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Filley, Giles F.; and Kindig, Neal B., 4,548,817, Cl. 424-127.000.
Kindsvater, James P.: *See*—
Sugden, David B.; Waddell, Bruce A.; Kindsvater, James P.; and Moffat, Robert B., 4,548,442, Cl. 299-10.000.
King, Donald L.; Ruff, Robert O.; and Schwarz, Ernest D., II, to American Standard Inc. Hinge preparation assembly for a steel door. 4,547,930, Cl. 16-382.000.
King, William R., to Phillips Petroleum Company. Addition of fillers to the bed of a particle form evaporator. 4,547,976, Cl. 34-10.000.
Kinney, Ohler L., Jr.; and Lillig, Donald J., to Marley Cooling Tower Company. Vacuum formable water cooling tower film fill sheet with integral spacers. 4,548,766, Cl. 261-112.000.
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Matsui, Toshio; Doi, Yasuhiro; Kinoshita, Keichi; and Ishiguro, Kuniaki, 4,548,403, Cl. 271-296.000.
Kinoshija, Kunio, to Olympus Optical Co., Ltd. Air and liquid supplying device for endoscope. 4,548,197, Cl. 128-4.000.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,548,169, Cl. 123-195.00C.
Kirby, Neil V.: *See*—
DeRoche, Pierre; and Kirby, Neil V., 4,548,976, Cl. 524-249.000.

Kirkbride, David W. Method and valve for preventing electrokinetic induced corrosion erosion of metering edges in hydraulic valves. 4,548,223, Cl. 137-1.000.

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Kishido, Takeshi: *See*—
Yoshino, Tetsuya; Kageyama, Takashi; Kato, Kazuo; and Kishido, Takeshi, 4,548,837, Cl. 427-209.000.

Kiss, Bela: *See*—
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.

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Kiuchi, Takeo: *See*—
Ishikawa, Yoshikazu; and Kiuchi, Takeo, 4,548,181, Cl. 123-492.000.

Kiuchi, Tsutomu: *See*—
Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; and Kiuchi, Tsutomu, 4,549,201, Cl. 358-13.000.

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Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,548,801, Cl. 423-584.000.

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Tachibana, Akira; and Kiyoto, Masami, 4,549,181, Cl. 340-904.000.

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Klein, Helmut: *See*—
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, 4,549,032, Cl. 585-445.000.

Klein, Karl-Heinz: *See*—
Kraus, Josef; and Klein, Karl-Heinz, 4,548,346, Cl. 228-47.000.

Klein, Robert D.: *See*—
Brist, Kenneth; and Klein, Robert D., 4,549,072, Cl. 219-400.000.

Kleiner, Hans-Jerg; and Dursch, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of vinylphosphonic acid dichloride and 2-chloroethanephosphonic acid dichloride. 4,548,762, Cl. 260-543.00P.

Kline, William T.; and Mittelstadt, Robert F., to Boeing Company, The. Breather material and method of coating fabric with silicone rubber. 4,548,859, Cl. 428-251.000.

Klotz, Helmut: *See*—
Dinger, Hans; and Klotz, Helmut, 4,548,039, Cl. 60-606.000.

Kniege, Wilfried: *See*—
Steinberger, Helmut; Moretto, Hans-Heinrich; Michel, Werner; and Kniege, Wilfried, 4,548,999, Cl. 525-453.000.

Knifton, John F.: *See*—
McEntire, Edward E.; Knifton, John F.; Nieh, Edward C. Y.; and Sellstrom, Kathy B., 4,549,017, Cl. 544-168.000.

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Knoll, Jerry: *See*—
Howard, Robert; and Knoll, Jerry, 4,548,353, Cl. 232-4.00R.

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Beck, Gerhard; Bartmann, Wilhelm; Knolle, Jochen; and Rupp, Richard H., 4,548,936, Cl. 514-422.000.

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Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.

Kobayashi, Koji; and Shimizu, Keisuke, to Hokkai Can Co., Ltd.; and Snow Brand Milk Products Co., Ltd. Container with easy open type closure. 4,548,333, Cl. 220-276.000.

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Kobayashi, Satoru: *See*—
Akiba, Juji; Kobayashi, Satoru; and Sugibuchi, Hiroyuki, 4,549,171, Cl. 340-605.000.

Kobayashi, Tetuo; and Hirai, Syoichi, to Nippon Cable System, Inc. Window regulator. 4,547,993, Cl. 49-352.000.

Kobayashi, Toshiro: *See*—
Hayashi, Motoshige; and Kobayashi, Toshiro, 4,548,775, Cl. 264-45.500.

Kockums Industri AB: *See*—
Eklund, Urban, 4,548,247, Cl. 144-357.000.

Kodama, Takuma: *See*—
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.

Koenig, Leonard R.: *See*—
Chen, Nai Y.; and Koenig, Leonard R., 4,549,031, Cl. 585-408.000.

Koepke, Jeffery W.: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,548,705, Cl. 208-111.000.

Koh-I-Noor Rapidograph, Inc.: *See*—
Hojer, Anke; Bockmann, Jurgen; Hofmann, Harald; Mikuteit, Axel; Ritter, Hans-Joachim; and Tenhagen, Rolf, 4,548,325, Cl. 211-69.500.

Kohler, Charles F., to Whirlpool Corporation. Ventilating means for cooking apparatus. 4,549,055, Cl. 219-10.55R.

Kohshin Seimitsu Kikai Kabushiki Gaisha: *See*—
Hirose, Tomonao, 4,548,145, Cl. 112-240.000.

Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; and Kojima, Tetsuhiko, 4,548,731, Cl. 252-299.630.

Kokubu, Tatsuo: *See*—
Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, 4,548,926, Cl. 514-19.000.

Kolesinski, Henry S.; and Taylor, Lloyd D., to Polaroid Corporation. Compositions and articles containing polymeric vinyl aromatic aminimides. 4,548,981, Cl. 524-555.000.

Kolm, Eric A.; and Kolm, Henry H., to Piezo Electric Products, Inc. Heat-sensitive variable-resistance light socket insert with resilient contact. 4,549,115, Cl. 315-71.000.

Kolm, Henry H.: *See*—
Kolm, Eric A.; and Kolm, Henry H., 4,549,115, Cl. 315-71.000.

Komaki, Kazushige: *See*—
Yokota, Mitsuru; Fujioka, Shuji; Goshima, Tsutomu; Kenjo, Hideki; and Komaki, Kazushige, 4,548,983, Cl. 524-726.000.

Komoto, Akira, to Shimadzu Corporation. Electronic balance. 4,548,288, Cl. 177-180.000.

Komura, Seiichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Medical equipment supporting device. 4,548,373, Cl. 248-122.000.

Kondo, Asaji: *See*—
Sekikawa, Nobuyoshi; Katsuyama, Harumi; and Kondo, Asaji, 4,548,906, Cl. 436-113.000.

Kondo, Hikaru, to Victor Company of Japan, Limited. Load impedance detector for audio power amplifiers. 4,549,147, Cl. 330-297.000.

Kondo, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device. 4,549,198, Cl. 357-42.000.

Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, to Meiji Seika Kaisha, Ltd. Antibiotic SF-2288 and its preparation method. 4,548,816, Cl. 424-116.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,548,899, Cl. 430-558.000.
Yoshino, Tetsuya; Kageyama, Takashi; Kato, Kazuo; and Kishido, Takeshi, 4,548,837, Cl. 427-209.000.

Kontakta Alkatreszgyar: *See*—
Trummer, Gabor, 4,548,534, Cl. 411-61.000.

Korema GmbH & Co. KG: *See*—
Merz, Gunther, 4,548,429, Cl. 285-236.000.

Korenberg, Jakob, to York-Shipley, Inc. Fast fluidized bed reactor and method of operating the reactor. 4,548,138, Cl. 110-245.000.

Koshino, Yoshinori; and Nakajima, Shiro, to Sumitomo Electric Industries Ltd. Negative acting disc brake. 4,548,301, Cl. 188-196.00C.

Koslow, Evan E., to Koslow Technologies Corporation. Portable self-contained oxygen generator apparatus and method. 4,548,730, Cl. 252-186.430.

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Koslow, Evan E., 4,548,730, Cl. 252-186.430.

Kosonocky, Walter F.; and Shallcross, Frank V. L., to RCA Corporation. Method of making a charge-coupled device imager which includes an array of Schottky-barrier detectors. 4,548,671, Cl. 156-643.000.

Koster, William H.: *See*—
Kimball, Spencer D.; Kronenthal, David; and Koster, William H., 4,548,751, Cl. 260-245.400.

Kosuage Planning Co. Ltd.: *See*—
Kosuge, Masana, 4,548,588, Cl. 441-57.000.

Kosuge, Masana, to Kosuage Planning Co. Ltd. Swimming aid. 4,548,588, Cl. 441-57.000.

Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,549,128, Cl. 322-99.000.

Koutonen, Pauli, to Oy Wartsila Ab. Method and arrangement for observing a position. 4,548,105, Cl. 83-13.000.

Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; Foroulis, Z. Andrew; and Baldwin, Francis P., to Exxon Research & Engineering Co. Process for the manufacture of halogenated polymers. 4,548,995, Cl. 525-354.000.

Koyama, Mototsugu: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,548,126, Cl. 92-213.000.

Koyama, Sadao, to Tokiwado Kaminari Okoshi Co., Ltd. Instant rice gruel and method for producing same. 4,548,830, Cl. 426-620.000.

Koyama, Shigeo; and Sakata, Hiromi, to Mita Industrial Co., Ltd. Copying paper conveying device in electrostatic copying apparatus. 4,548,394, Cl. 271-9.000.

Kozuka, Masayoshi; Mizutani, Tomihiko; and Narita, Kohji, to Inoue MTP Kabushiki Kaisha. Decorative plastic trim strip. 4,548,843, Cl. 428-31.000.

Kraus, Josef; and Klein, Karl-Heinz, to Kuka Schweissanlagen & Roboter GmbH. Dual line production system and method. 4,548,346, Cl. 228-47.000.

Krause, Lothar: *See*—
Topperwien, Bernd; and Krause, Lothar, 4,548,113, Cl. 83-345.000.

Kreft, Hans-Dietrich, to Angewandte Digital Elektronik GmbH. Device for identifying an information particularly an electronic lock-/key combination. 4,549,176, Cl. 340-825.310.

Kreiskott, Horst: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,548,933, Cl. 514-255.000.

Kress, Hans-Jurgen: *See*—
Bauer, Wolfgang; Lindner, Christian; Muller, Friedemann; Kress, Hans-Jurgen; Zabrocki, Karl; and Buekers, Josef, 4,548,987, Cl. 525-67.000.

Kretzschmar, Wolfgang: *See*—
Bode, Albert; Chambers, Thomas V.; Hahnke, Manfred; and Kretzschmar, Wolfgang, 4,548,613, Cl. 8-638.000.

Kriebel, John E.; and Jones, Walton B., to Capital Controls Company, Inc. Self-cleaning gas-liquid mixing apparatus. 4,548,359, Cl. 239-434.000.

Krivorotenko, Valentin I.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Krohn, Rasmus A. R., to Elmwood Sensors Limited. Sensing devices for mounting in chamber walls and a method of manufacture. 4,548,780, Cl. 264-272.150.

Kronenthal, David: *See*—
Kimball, Spencer D.; Kronenthal, David; and Koster, William H., 4,548,751, Cl. 260-245.400.

Krueger, Martin H.: *See*—
D'Aniello, Michael J., Jr.; Monroe, David R.; and Krueger, Martin H., 4,548,911, Cl. 502-28.000.

Krueter, Kenneth G. Wind speed and direction indicator. 4,548,074, Cl. 73-189.000.

Kruger, Bernd-Wieland; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Thiophosphonic acid ester pesticides. 4,548,931, Cl. 514-141.000.

Kruse, Friedel, to Hauni-Werke Korber & Co. KG. Packing machine for cigarettes or the like. 4,548,019, Cl. 53-170.000.

Kub, Francis J., to Westinghouse Electric Corp. Lateral bipolar transistor. 4,549,196, Cl. 357-35.000.

Kubis, Charles S.: *See*—
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,548,668, Cl. 156-357.000.

Kubo, Sanae; and Nakamura, Fumiaki, to Shiseido Company Ltd. Waving lotion for cold waving. 4,548,811, Cl. 424-71.000.

Kubota, Ltd.: *See*—
Maeoka, Kazuyuki, 4,548,027, Cl. 56-10.200.
Tanaka, Tomiho; and Osujo, Masahide, 4,548,291, Cl. 180-321.000.

Kubotera, Hiroshi; Ogawa, Kenji; and Hatakeyama, Kenji, to Mitsui Engineering & Shipbuilding Co., Ltd.; and Kajima Corporation. Apparatus for taking up rod type materials. 4,548,337, Cl. 414-276.000.

Kuchuk-Yatsenko, Sergei I.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Kudo, Koji: *See*—
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.

Kugler, Edwin L.: *See*—
Fiato, Rocco A.; and Kugler, Edwin L., 4,548,953, Cl. 518-717.000.

Kuji, Mitsugu: *See*—
Uehara, Seigo; Yamanouchi, Hiroshi; and Kuji, Mitsugu, 4,549,237, Cl. 360-71.000.

Kuka Schweissanlagen & Roboter GmbH: *See*—
Kraus, Josef; and Klein, Karl-Heinz, 4,548,346, Cl. 228-47.000.
Zimmer, Ernst, 4,548,097, Cl. 74-665.00M.

Kulakowski, Michel: *See*—
Castel, Rene; Dalboussiere, Gerard; and Kulakowski, Michel, 4,549,296, Cl. 371-16.000.

Kumar, Mahesh, to RCA Corporation. Broadband adjustable phase modulation circuit. 4,549,152, Cl. 332-23.00R.

Kumata, Fujio: *See*—
Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, 4,548,777, Cl. 264-107.000.

Kunin, Robert; and Salem, Eli, to Graver Company, The. Method for treating aqueous solutions with weakly acidic cation exchange resins. 4,548,717, Cl. 210-670.000.

Kupczyk, Werner, to Fredenhagen KG. Floor conveyor system. 4,548,135, Cl. 104-135.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Nagai, Hirosi; and Nishimura, Yasushi, 4,548,959, Cl. 523-115.000.
Yagitani, Takayuki; Matsui, Hiromasa; Ito, Akira; and Ueno, Toshishige, 4,548,745, Cl. 252-567.000.

Kuroda, Akio: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.

Kurokawa, Junzi: *See*—
Osaki, Kazuhiko; Hamamoto, Hirofumi; Kurokawa, Junzi; and Akieda, Shigeru, 4,547,946, Cl. 29-412.000.

Kuroki, Katsuro: *See*—
Kimoto, Tetsuo; Orita, Kiyoshi; and Kuroki, Katsuro, 4,548,656, Cl. 148-111.000.

Kurowski, Henry B.: *See*—
Cullen, Robert E.; Kurowski, Henry B.; and Sidwell, William S., 4,547,938, Cl. 28-254.000.

Kurtz, Thomas D. Press-on type finger pull. 4,548,846, Cl. 428-40.000.

Kusazaki, Yoshimasa, to Olympus Optical Company Limited. Semiconductor device and technique which employs normally unused interconnection elements as resistor circuit elements. 4,549,131, Cl. 323-354.000.

Kvalo, Michael L.: *See*—
Reisgies, Rolf W.; and Kvalo, Michael L., 4,548,161, Cl. 119-14.170.

KV33 Corporation: *See*—
Huffman, Ronald E., 4,548,581, Cl. 433-64.000.

La Salle Marine, Inc.: *See*—
Files, James H.; and Montague, John M., 4,548,151, Cl. 114-219.000.

Laber, Walter: *See*—
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, 4,549,032, Cl. 585-445.000.

Laflin, Philip; Eddleston, Ian; and Hepworth, Mathew A., to T&N Materials Research Limited. Flexible sheet material and articles made therefrom. 4,548,678, Cl. 162-146.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,549,279, Cl. 364-709.000.

LaJet Energy Company: *See*—
Williams, Carl L., Jr.; and Payne, Larry R., 4,548,482, Cl. 350-608.000.

Lakeview Window Corporation: *See*—
Tippmann, Eugene R., 4,547,995, Cl. 49-457.000.

Lance, Joseph R.; and Spurrier, Francis R., to Westinghouse Electric Corp. Heated transportable fuel cell cartridges. 4,548,875, Cl. 429-26.000.

Landy, Jerome J. Fume hood with modular blower and filter assembly. 4,548,627, Cl. 55-385.00A.

Lane, Byron D. Wind cap. 4,548,137, Cl. 110-184.000.

Lane, Charles S.: *See*—
Press, Irving D.; and Lane, Charles S., 4,548,427, Cl. 285-55.000.

Lane, Lynn R.: *See*—
Heidel, Jeffrey C.; Hoogervorst, Thomas R.; Lane, Lynn R.; and Swartz, Harold L., 4,547,972, Cl. 33-366.000.

Lang, Paul R., to General Motors Corporation. Illuminated control knob for electric switch. 4,549,050, Cl. 200-314.000.

Lange, Horst, to Rhein-Nadel Maschinennadel GmbH. Method of producing sewing machine needles. 4,548,251, Cl. 163-5.000.

Langeraar, Huibert B.; and Van Der Schoot, Alexander P. M., to Hollandse Signaalapparaten B.V. Interference suppression unit for a sonar apparatus. 4,549,286, Cl. 367-97.000.

Langley, Marlyn: *See*—
Blackborow, Malcolm H.; and Langley, Marlyn, 4,547,925, Cl. 15-250.420.

Lapeyre, James M., to Laitram Corporation, The. Single hand, single finger stroke alphameric data processing keyboard system. 4,549,279, Cl. 364-709.000.

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Macovski, Albert, 4,549,307, Cl. 378-145.000.
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Levine, Alfred B. Selective time scheduler and subscheduler. 4,548,510, Cl. 368-10.000.
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Massimo, Bucefari; and Michele, Lazzarini, to I.C.M. S.p.A. Italiana Costruzioni Metalmeccaniche. Machine for producing ornamental chains made up of links of different forms and/or dimensions connected in any programmable sequence. 4,548,031, Cl. 59-16.000.

Masuda, Hisaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Process variable transmitter. 4,549,180, Cl. 340-870.040.

Masuda, Shunichi; and Satoh, Yukio, to Canon Kabushiki Kaisha. Optical communication apparatus. 4,549,314, Cl. 455-618.000.

Masuda, Yukihiro: *See*—
Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, 4,549,117, Cl. 315-371.000.

Mathieu, Julien C., to Dayco Corporation. Method for forming a railway center plate liner. 4,548,666, Cl. 156-245.000.

Mathis, Paul; and Zimmer, Max, to Mathis System-Technik GmbH. Mixing apparatus for the production of mixtures. 4,548,507, Cl. 366-20.000.

Mathis, Ronald D.: *See*—
Martinovich, Robert J.; Mathis, Ronald D.; and Shiflet, Roger T., 4,548,971, Cl. 524-101.000.

Mathis System-Technik GmbH: *See*—
Mathis, Paul; and Zimmer, Max, 4,548,507, Cl. 366-20.000.

Matsuda, Hideaki: *See*—
Doi, Hidemi; Okamoto, Takanori; and Matsuda, Hideaki, 4,548,992, Cl. 525-167.000.

Matsuda, Kazuo; and Morita, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Hydrostatic transmission. 4,548,036, Cl. 60-464.000.

Matsuda, Takao: *See*—
Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.

Matsuda, Yasuo: *See*—
Honbu, Mitsuyuki; Matsuda, Yasuo; Suzuki, Katsunori; and Kajita, Yoshiki, 4,549,258, Cl. 363-71.000.
Ueda, Shigeta; Hombu, Mitsuyuki; and Matsuda, Yasuo, 4,549,259, Cl. 363-137.000.

Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, to Sankyo Company Limited. Hypotensive peptides and their use. 4,548,926, Cl. 514-19.000.

Matsui, Hiromasa: *See*—
Yagitani, Takayuki; Matsui, Hiromasa; Ito, Akira; and Ueno, Toshishige, 4,548,745, Cl. 252-567.000.

Matsui, Noboru: *See*—
Sakai, Katsuhide; and Matsui, Noboru, 4,548,860, Cl. 428-290.000.

Matsui, Toshio; Doi, Yasuhiro; Kinoshita, Keichi; and Ishiguro, Kuniaki, to Minolta Camera Kabushiki Kaisha. Sorter. 4,548,403, Cl. 271-296.000.

Matsuki, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the supercharging pressure of a turbocharged internal combustion engine. 4,548,038, Cl. 60-602.000.

Matsumoto, Kenzo: *See*—
Saito, Toshio; Matsumoto, Kenzo; and Soji, Kazuo, 4,549,260, Cl. 364-143.000.

Matsumoto, Shinichi: *See*—
Kawai, Taiyo; Habu, Nobuo; and Matsumoto, Shinichi, 4,548,175, Cl. 123-308.000.

Matsumura, Kunihiko: *See*—
Tezuka, Sadao; Tanaka, Yasuhiko; Matsumura, Kunihiko; Yamamoto, Tadao; Suzuki, Nobuyoshi; and Tsurukawa, Toshio, 4,548,259, Cl. 165-14.000.

Matsuo, Junichi: *See*—
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,548,985, Cl. 525-65.000.

Matsuo, Katsuharu. Temperature controller for providing a rapid initial heating cycle using a variable reference voltage. 4,549,074, Cl. 219-505.000.

Matsuoka, Shigeru; Yamauchi, Koji; Tadokoro, Hiroyuki; Yonekura, Seiji; and Suzuki, Mitsuo, to Hitachi, Ltd. Control system for illumination lamp installed in building equipped with door operation control apparatus. 4,549,092, Cl. 307-116.000.

Matsushima, Hiroshi: *See*—
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; and Takeuchi, Kousou, 4,549,167, Cl. 340-347.0DD.

Matsushita Electric Industrial Co. Ltd.: *See*—
Hirauchi, Yukio, 4,548,575, Cl. 431-88.000.
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; and Takeuchi, Kousou, 4,549,167, Cl. 340-347.0DD.
Ozawa, Lyuji, 4,549,083, Cl. 250-458.100.
Saito, Toshio; Matsumoto, Kenzo; and Soji, Kazuo, 4,549,260, Cl. 364-143.000.
Takahashi, Katsuhiro; Watanabe, Keiichi; Hoshihara, Naoto; and Jinbo, Hiroyuki, 4,548,835, Cl. 427-123.000.
Tomita, Masao, 4,549,226, Cl. 358-328.000.
Yamamoto, Yoshiharu; Nakajima, Yasuo; and Nagaoka, Yoshitomi, 4,548,480, Cl. 350-432.000.

Matsuura, Masataka: *See*—
Funada, Fumiaki; Takamatsu, Toshiaki; Yasuda, Shuuhei; and Matsuura, Masataka, 4,549,174, Cl. 340-784.000.

Matsuura, Yoshikazu, to Teraoka Seiko Co., Ltd. Combination weighing machine with vibratory feeding and collecting hopper. 4,548,287, Cl. 177-25.000.

Matthes, Hans G.; and Wittenbecher, Hasso, to AEG-Elotherm. Inverter arcing control for a parallel-resonant circuit static frequency changer. 4,549,256, Cl. 363-39.000.

Matthews, John C., to Fusion Semiconductor Systems. Hardening of photoresist. 4,548,688, Cl. 204-159.180.

Mattison, Glenn D.: *See*—
Case, Michael A.; Mattison, Glenn D.; and Counterman, Wayne S., 4,548,261, Cl. 165-82.000.

Maucher, Paul, to Luk Lamellen Und Kupplungsbau GmbH. Torque transmitting device. 4,548,310, Cl. 192-106.200.

Maurer, Ghislain: *See*—
Motte, Jean-Pierre; and Maurer, Ghislain, 4,549,301, Cl. 373-108.000.

Maurer, Ruprecht, to Ringspann Albrecht Maurer, K.G. Run-back safety mechanism for conveyor apparatus. 4,548,316, Cl. 198-835.000.

Maxner, Richard B.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., 4,549,087, Cl. 250-561.000.

Mayer, William; and Runions, Alton E., to Stewart-Warner Corporation. Arc tube and plastic reflector assembly method. 4,548,589, Cl. 445-4.000.

Mayfield, William C. Mask transference and alignment apparatus. 4,548,493, Cl. 355-125.000.

Maytag Company, The: *See*—
Simon, Donald J., 4,549,052, Cl. 219-10.49R.

Mazda Motor Corporation: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.

McAndless, John M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Constant pressure/G-force diffusion cell system. 4,548,072, Cl. 73-159.000.

McAninch, Terry L.: *See*—
Swanson, Harley D.; McAninch, Terry L.; and Conner, J. Keith, 4,548,608, Cl. 8-94.160.

McCool, Michael A.: *See*—
Nanda, Ashok K.; Silveri, Luigi; and McCool, Michael A., 4,548,673, Cl. 162-4.000.

McCormick, Mack H.: *See*—
Higgins, Harvey M., Jr.; Merkel, Kurt E.; and McCormick, Mack H., 4,548,925, Cl. 514-10.000.

McCormick, Marty P.: *See*—
Kelly, Lawrence S.; McCormick, Marty P.; and Weikel, William A., 4,548,652, Cl. 134-22.120.

McCoy, David R.: *See*—
Morris-Sherwood, Betty J.; Brink, Edward C., Jr.; McCoy, David R.; and McEntire, Edward E., 4,548,726, Cl. 252-75.000.

McDermott, Thomas C., III, to Rockwell International Corporation. Digital time delay circuit with high speed and large delay capacity. 4,549,283, Cl. 365-194.000.

McDonough, Charles M., to PCF Group, Inc. Muzzle for electrostatic spray gun. 4,548,363, Cl. 239-698.000.

McDowall, William L.; and Maplesden, Alan K. Secondary batteries. 4,547,939, Cl. 29-2.000.

McEntire, Edward E.; Knifton, John F.; Nieh, Edward C. Y.; and Sellstrom, Kathy B., to Texaco Inc. Process for the production of N-substituted (meth)acrylamides from (meth)acrylates and amines over a metal oxide or alkoxide catalyst. 4,549,017, Cl. 544-168.000.

McEntire, Edward E.: *See*—
Morris-Sherwood, Betty J.; Brink, Edward C., Jr.; McCoy, David R.; and McEntire, Edward E., 4,548,726, Cl. 252-75.000.

McFeaters, Earl: *See*—
Ang, T. Liem; Van Arnam, Donald; and McFeaters, Earl, 4,549,063, Cl. 219-121.0LJ.

McGehee, Wallace L. Bone emulsifying method. 4,548,829, Cl. 426-518.000.
McGhee, James B.; and Tweedie, Thomas D., to Hill, Leslie C. Thermostat control apparatus. 4,549,159, Cl. 337-301.000.
McGhee, James B., to Hill, Leslie C. Thermostat control apparatus. 4,549,160, Cl. 337-301.000.
McGill, Eugene C., to McGill Incorporated. Linear combustion apparatus for atmospheric burning of flare gases. 4,548,577, Cl. 431-202.000.
McGill Incorporated: *See*—
McGill, Eugene C., 4,548,577, Cl. 431-202.000.
McGill, Paul E.: *See*—
Pitigliano, Frank J.; and McGill, Paul E., 4,548,569, Cl. 425-133.100.
McGillvray, Philip J.: *See*—
Taylor, Andrew J.; and McGillvray, Philip J., 4,549,127, Cl. 320-21.000.
McGourty, Lawrence F.: *See*—
McGourty, Thomas K.; and McGourty, Lawrence F., 4,548,523, Cl. 400-617.000.
McGourty, Thomas K.; and McGourty, Lawrence F., to Varitronic Systems, Inc. Precision tape feed and guide mechanism. 4,548,523, Cl. 400-617.000.
McLaughlin, Michael J., to Motorola, Inc. Method and apparatus for measuring the strength of a radio signal frequency. 4,549,311, Cl. 455-277.000.
McLaughlin, Robert. Faucet repair system. 4,548,224, Cl. 137-15.000.
McLean, Jean A.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., 4,549,087, Cl. 250-561.000.
McMillan, Michael R. Synthetic plasma ion source. 4,549,082, Cl. 250-423.00R.
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., to Raychem Corporation. PTC Circuit protection device. 4,549,161, Cl. 338-20.000.
Mead Corporation, The: *See*—
Shackleton, Craig, 4,549,188, Cl. 346-1.100.
Meadows, Roger D., to Dayco Corporation. Method of making a compressible printing blanket and a compressible printing blanket produced thereby. 4,548,858, Cl. 428-224.000.
Mechling, Richard W. Variable resistance tiltboard for evaluation of balance reactions. 4,548,289, Cl. 128-774.000.
Medtronic, Inc.: *See*—
Niemi, Bill H., 4,548,208, Cl. 128-419.00F.
Wielders, Pierre G. E.; and Leinders, Robert, 4,548,209, Cl. 128-419.00D.
Meffert, Alfred: *See*—
Hoefer, Rainer; Meffert, Alfred; and Wegemund, Bernd, 4,549,002, Cl. 526-209.000.
Megargee, Theresa M. Air propelled projectile launcher. 4,548,190, Cl. 124-56.000.
Megna, Ignazio S., to American Cyanamid Company. Catalyst compositions for polyaliphatic isocyanate-based polyurethanes. 4,548,919, Cl. 502-154.000.
Meharg, Richard D.; and Singletary, Buckley A., to Sears, Roebuck & Co. Apparatus for operating a line driven device. 4,548,250, Cl. 160-331.000.
Meier, Gudrun, to Soudbrase-Schweisstechnik GmbH. Method for repairing housings of pumps and the like. 4,547,941, Cl. 29-156.40R.
Meier, Gunter: *See*—
Herbert, Adolf; Anders, Dietmar; and Meier, Gunter, 4,548,568, Cl. 425-131.100.
Meier, Willi, to Dorina Nahmaschinene GmbH. Sewing machine with cam type stitch pattern control. 4,548,144, Cl. 112-465.000.
Meiji Seika Kaisha, Ltd.: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.
Meisel, Werner: *See*—
Schwarzer, Hans; and Meisel, Werner, 4,548,708, Cl. 208-196.000.
Melles, Harold W.: *See*—
Beemer, Richard B.; Hennessey, Richard G.; and Melles, Harold W., 4,548,303, Cl. 192-3.310.
Mellinger, Gary A.; Giles, Harold F., Jr.; Holub, Fred; and Schlich, William R., to General Electric Company. Polyetherimide-polycarbonate blends. 4,548,997, Cl. 525-433.000.
Mentor O & O, Inc.: *See*—
Reimels, Harry G., 4,548,207, Cl. 128-303.170.
Merck & Co., Inc.: *See*—
Halczenko, Wasyl; and Hartman, George D., 4,548,941, Cl. 514-295.000.
Sparer, Randall V.; and Pogany, Stefano A., 4,549,010, Cl. 528-361.000.
Merideth, Jeffrey O.: *See*—
Lee, Robert C.; Weigand, Larry J.; and Merideth, Jeffrey O., 4,548,405, Cl. 272-69.000.
Merkel, Kurt E.: *See*—
Higgins, Harvey M., Jr.; Merkel, Kurt E.; and McCormick, Mack H., 4,548,925, Cl. 514-10.000.
Merlin Gerin: *See*—
Nebon, Jean-Pierre; Barnel, Pierre; Denis, Robert; and Bertrand, Claude, 4,549,242, Cl. 361-115.000.
Mersereau, Robert E.: *See*—
Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, 4,548,400, Cl. 271-226.000.
Mertens, Josephus C.: *See*—
Kennis, Ludo E. J.; and Mertens, Josephus C., 4,548,938, Cl. 514-258.000.
Merz, Gunther, to Korema GmbH & Co. KG. Releasable clamping connection. 4,548,429, Cl. 285-236.000.
Meslin, Jacques P.; and Meslin, Laurence C. Portable chair and improved tray with locking container. 4,548,440, Cl. 297-174.000.
Meslin, Laurence C.: *See*—
Meslin, Jacques P.; and Meslin, Laurence C., 4,548,440, Cl. 297-174.000.
Messer, Charles L. Flush-mounted liquid dispenser. 4,548,340, Cl. 222-135.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Puritz, Wolfgang; and Lengen, Wilhelm, 4,548,345, Cl. 227-58.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, 4,549,032, Cl. 585-445.000.
Sauer, Harald; Schmidt, Hans-Werner; and Fennemann, Wolfgang, 4,548,797, Cl. 423-240.000.
Metcalfe, Robert S.: *See*—
Sheffield, Miller; Metcalfe, Robert S.; and Calvin, James W., 4,548,267, Cl. 166-268.000.
Metzdorf, Jacques: *See*—
Liesch, Jean; Metzdorf, Jacques; Meyers, Andre ; Neu, Joseph; and Redo, Jean, 4,548,503, Cl. 356-373.000.
Metzger, Karl G.: *See*—
Fengler, Gerd; Arlt, Dieter; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,548,934, Cl. 514-225.000.
Metzner, Uwe, to Siemens Aktiengesellschaft. Measuring arrangement for capacitive security fences. 4,549,133, Cl. 324-60.00R.
Meunier, Francis: *See*—
Brandon, Bernard; Bailly, Andre ; and Meunier, Francis, 4,548,046, Cl. 62-79.000.
Meyers, Andre : *See*—
Liesch, Jean; Metzdorf, Jacques; Meyers, Andre ; Neu, Joseph; and Redo, Jean, 4,548,503, Cl. 356-373.000.
Meyers, Liliane: *See*—
Hageman, Jacques; and Meyers, Liliane, 4,548,674, Cl. 162-5.000.
Meyers, Louis B. Method for making carbonated beverages. 4,548,828, Cl. 426-477.000.
Michaels, Leonard H.: *See*—
Masheris, Fred; Michaels, Leonard H.; Scott, William J.; and Voss, Roy N., 4,549,038, Cl. 174-65.0SS.
Michaels, Sheldon B.; and Giubardo, Mark J., to Digital Marine Electronics Corporation. Radio receiver with automatic interference and distortion compensation. 4,549,312, Cl. 455-311.000.
Michalik, John K., to Warner-Lambert Technologies, Inc. Current to frequency converter switched to increased frequency when current input low. 4,549,149, Cl. 331-66.000.
Michel, Diaz; and Christian, Loeillet, to Manufacture Industrielle de Cycles et Motocycles - M.I.C.M.O. Bicycle frame having an assembled-unit shell structure. 4,548,422, Cl. 280-281.00R.
Michel, Karl H., to Eli Lilly and Company. Antibiotics M43B and M43C, pharmaceutical composition and method of use. 4,548,924, Cl. 514-10.000.
Michel, Werner: *See*—
Steinberger, Helmut; Moretto, Hans-Heinrich; Michel, Werner; and Kniege, Wilfried, 4,548,999, Cl. 525-453.000.
Michele, Lazzarini: *See*—
Massimo, Bucefari; and Michele, Lazzarini, 4,548,031, Cl. 59-16.000.
Micheletti, Rosamaria: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; del Soldato, Piero; Giachetti, Antonio; and Micheletti, Rosamaria, 4,548,944, Cl. 514-363.000.
Michna, Martin; and Henk, Hermann, to Bayer Aktiengesellschaft. Process for the preparation of 1-aminobenzene-2-sulphonic acids. 4,548,761, Cl. 260-508.000.
Microdynamics, Inc.: *See*—
Martell, Charles R.; Isett, Donald D.; and Treadwell, Stephen S., 4,548,143, Cl. 112-121.110.
Middleton, Daryl J.; and Grenier, Jodyne I., to Ford Motor Company. Method of making an infrared reflective glass sheet-II. 4,548,836, Cl. 427-160.000.
Midland-Ross Corporation: *See*—
Hoetzl, Max, 4,548,052, Cl. 62-374.000.
Miep Holdings Inc.: *See*—
deWalle, Stewart; and deWalle, Richard T., 4,547,962, Cl. 29-606.000.
Mikami, Keigo: *See*—
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.
Mikuni Kogyo Co., Ltd.: *See*—
Ishida, Takashi; Shimizu, Kenshi; and Kamiyama, Shuichi, 4,548,176, Cl. 123-342.000.
Mikuteit, Axel: *See*—
Hojer, Anke; Bockmann, Jurgen; Hofmann, Harald; Mikuteit, Axel; Ritter, Hans-Joachim; and Tenhagen, Rolf, 4,548,325, Cl. 211-69.500.
Miles Laboratories, Inc.: *See*—
Schmidt, Thomas R., 4,548,822, Cl. 426-96.000.
Miles, Ronald C., to Olin Corporation. Catholyteless membrane electrolytic cell. 4,548,694, Cl. 204-257.000.

Miller, Ernest J.: *See*—
Diener, Lester; and Miller, Ernest J., 4,548,130, Cl. 99-345.000.
Miller, Paul B.: *See*—
York, Earl D.; Johnson, David M.; and Miller, Paul B., 4,548,702, Cl. 208-11.00R.
Miller, Peter S., to Owens-Illinois, Inc. Servo-control of machine motions in manufacture of glass containers. 4,548,637, Cl. 65-163.000.
Miller, Robert A.; and Condrac, Edward J., to Elliott Turbomachinery Company, Inc. Method and apparatus for determining when to initiate cleaning of turbocharger turbine blades. 4,548,040, Cl. 60-619.000.
Miller, Robert F., to Allegheny Ludlum Steel Corporation. Method for producing cube-on-edge oriented silicon steel. 4,548,655, Cl. 148-111.000.
Millhone, Ralph S.: *See*—
Elson, Thomas D.; and Millhone, Ralph S., 4,548,269, Cl. 166-276.000.
Milne, David J.: *See*—
Andrews, William H.; Milne, David J.; Moyle, Ronald W.; and Peters, James P., 4,548,795, Cl. 423-126.000.
Milner, Morris: *See*—
Ginpil, Frederick D.; Milner, Morris; and Senders, John W., 4,547,918, Cl. 5-446.000.
Minamida, Kazukiyo; and Haze, Setsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus. 4,549,278, Cl. 364-567.000.
Minamishima, Mamoru, to Nakamichi Corporation. DC-To-DC conversion circuit with shared regulation of outputs. 4,549,255, Cl. 363-26.000.
Mine, Susumu; and Ishizaka, Takao, to Tokyo Shibaura Denki Kabushiki Kaisha. Superconducting magnet. 4,549,156, Cl. 335-216.000.
Ministry of International Trade and Industry: *See*—
Mitsuhashi, Yoshinobu; and Shimada, Junichi, 4,549,300, Cl. 372-50.000.
Minnesota Mining and Manufacturing Company: *See*—
Hartman, Richard B., 4,548,862, Cl. 428-323.000.
Nelson, Duane M., 4,548,597, Cl. 604-43.000.
Peterson, Donald G., 4,548,690, Cl. 204-159.230.
Sabongi, Gebran J.; and Poon, Stephen S. C., 4,548,896, Cl. 430-332.000.
Siedle, Allen R., 4,549,018, Cl. 544-225.000.
Minnesota Valley Engineering, Inc.: *See*—
Remes, R. Scott; and Thompson, Paul J., 4,548,335, Cl. 220-466.000.
Minolta Camera Kabushiki Kaisha: *See*—
Honda, Yasuhisa; and Ando, Makoto, 4,548,488, Cl. 354-402.000.
Matsui, Toshio; Doi, Yasuhiro; Kinoshita, Keichi; and Ishiguro, Kuniaki, 4,548,403, Cl. 271-296.000.
Minsky Motorny Zavod: *See*—
Vorobiev, Ivan Y.; Zharnov, Viktor M.; and Naumenko, Viktor D., 4,548,165, Cl. 123-41.840.
Mirley, William H., Jr.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., 4,549,087, Cl. 250-561.000.
Misaki, Yoshiki; and Owashi, Seiji, to Takeda Chemical Industries, Ltd. Ampoule inspecting method. 4,549,205, Cl. 358-106.000.
Missout, Bernard M., to Societe Anonyme de Telecommunications; and Societe Industrielle de Liaisons Electriques. Apparatus for manufacturing a grooved cylindrical core particularly for optical cable. 4,548,567, Cl. 425-113.000.
Misura, Michael S., to PPG Industries, Inc. Internally colored polyol (allyl carbonate) polymerizates comprising inorganic molybdenum compounds. 4,548,984, Cl. 524-780.000.
Mita Industrial Co., Ltd.: *See*—
Koyama, Shigeo; and Sakata, Hiromi, 4,548,394, Cl. 271-9.000.
Mitchell, Jerry L.; and Oberly, Jesse A., to Pakor, Inc. Package for storing perishable products in a reduced air atmosphere. 4,548,824, Cl. 426-111.000.
Mitchell, Jerry L., to Pakor, Inc. Method and apparatus for packaging perishable products in a reduced air atmosphere. 4,548,852, Cl. 426-111.000.
Mitchell, William J., Jr.: *See*—
Martinez, Miguel R.; and Mitchell, William J., Jr., 4,548,066, Cl. 73-1.00J.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,549,128, Cl. 322-99.000.
Nomura, Masami, 4,548,299, Cl. 187-29.00R.
Yamamoto, Sakuei; Nishida, Mitsuhiro; Inao, Hiroshi; Tashiro, Noboru; and Hani, Kiyoshi, 4,549,105, Cl. 310-87.000.
Mitsubishi Jukogyo K.K.: *See*—
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Irie, Nobuhiko, 4,548,781, Cl. 264-315.000.
Mitsubishi Mining and Cement Co., Ltd.: *See*—
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Yamada, Motoshige; and Ebato, Seigo, 4,548,898, Cl. 430-510.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Inoue, Masao; Suzuki, Shingo; and Saito, Syozo, 4,548,469, Cl. 350-128.000.
Yoshida, Tomohiko; and Mori, Hiroshi, 4,548,964, Cl. 523-455.000.
Mitsuhashi, Yoshinobu; and Shimada, Junichi, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Semiconductor laser device. 4,549,300, Cl. 372-50.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Kubotera, Hiroshi; Ogawa, Kenji; and Hatakeyama, Kenji, 4,548,537, Cl. 414-276.000.
Mitsui Mining & Smelting Co. Ltd.: *See*—
Miyazaki, Kazuhide; Kitamura, Yasuo; and Okada, Toshiteru, 4,548,684, Cl. 204-130.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Sakashita, Takeshi; and Nakano, Takayuki, 4,548,689, Cl. 204-159.230.
Mitsui, Tadashi; and Wasaki, Masaru, to TDK Corporation. Inductance element. 4,549,158, Cl. 336-83.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, 4,548,617, Cl. 51-293.000.
Mittelstadt, Robert F.: *See*—
Kline, William T.; and Mittelstadt, Robert F., 4,548,859, Cl. 428-251.000.
Miura, Nobuhiro: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,548,126, Cl. 92-213.000.
Miwa, Takao: *See*—
Shibaoka, Kazuo; Onishi, Shunji; Miwa, Takao; and Akimoto, Toshio, 4,548,634, Cl. 65-79.000.
Miyagi, Ken: *See*—
Sue, Yasuhiko; Ariga, Masao; Tamura, Yasuyuki; Nagashima, Nao; Miyagi, Ken; Nakaoka, Masaki; and Suda, Masashi, 4,549,219, Cl. 358-257.000.
Miyake, Masaaki; and Fukumori, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Filter medium and process for preparing same. 4,548,628, Cl. 55-487.000.
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, to Tokyo Shibaura Denki Kabushiki Kaisha; and Mitsui Toatsu Chemicals, Inc. Abrasive and method for manufacturing the same. 4,548,617, Cl. 51-293.000.
Miyauchi, Hideo: *See*—
Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, 4,548,564, Cl. 425-32.000.
Miyazaki, Kazuhide; Kitamura, Yasuo; and Okada, Toshiteru, to Mitsui Mining & Smelting Co. Ltd. Treatment of manganese nodules. 4,548,684, Cl. 204-130.000.
Mizuno, Yoshio: *See*—
Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; and Kiuchi, Tsutomu, 4,549,201, Cl. 358-13.000.
Mizusawa, Mitutoyo; and Fujisawa, Masao, to Nissin Kogyo Kabushiki Kaisha. Device for controlling hydraulic pressure for braking a vehicle. 4,548,445, Cl. 303-22.00A.
Mizutani, Tomihiko: *See*—
Kozuka, Masayoshi; Mizutani, Tomihiko; and Narita, Kohji, 4,548,843, Cl. 428-31.000.
Mobil Oil Corporation: *See*—
Bowes, Emmerson; Farcasiu, Malvina; and Scott, Eric J. Y., 4,548,709, Cl. 208-213.000.
Bridger, Robert F., 4,548,725, Cl. 252-56.00R.
Chen, Nai Y.; and Koenig, Leonard R., 4,549,031, Cl. 585-408.000.
Chu, Chin-Chiun, 4,548,914, Cl. 502-85.000.
Stowe, Lawrence R.; and Johnson, Warren F., 4,548,252, Cl. 166-299.000.
Mochida, Ei: *See*—
Nobuhara, Masahiro; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,548,900, Cl. 435-68.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Nobuhara, Masahiro; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,548,900, Cl. 435-68.000.
Mock, Gerald L.; and Hanscom, Bradford E., to T.A.D. Avanti, Inc. Telephone answering system with remote control capabilities. 4,549,046, Cl. 179-6.110.
Mockesch, Erich; and Noack, Hans-Herbert, to Bier-Drive AG. Foil bag. 4,548,321, Cl. 206-525.000.
Moeller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Guetlhuber, Friedrich; and Laber, Walter, to Metallgesellschaft Aktiengesellschaft; and Deggendorfer Werft und Eisenbau GmbH. Process for producing styrene. 4,549,032, Cl. 585-445.000.
Moessner, Gerhard, to Parke, Davis & Company. Cryostat microtome apparatus. 4,548,051, Cl. 62-320.000.
Moffat, Robert B.: *See*—
Sugden, David B.; Waddell, Bruce A.; Kindsvater, James P.; and Moffat, Robert B., 4,548,442, Cl. 299-10.000.
Mogi, Kinichi: *See*—
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Moldrup, Niels: *See*—
Moldrup, Steen; and Moldrup, Niels, 4,548,839, Cl. 427-345.000.
Moldrup, Steen; and Moldrup, Niels. Method for wood preservation. 4,548,839, Cl. 427-345.000.
Molecular Genetics Research & Development: *See*—
Kent, Stephen B. H.; and L'Italien, James J., 4,548,904, Cl. 436-89.000.
Molins Limited: *See*—
Ahern, Ronald A., 4,548,216, Cl. 131-94.000.

Mollier, Jean: *See*—
Saada, Charles; and Mollier, Jean, 4,549,075, Cl. 235-380.000.
Monahan, Daniel E. Automatic tracking system with infrared and ultraviolet detection. 4,549,078, Cl. 250-203.00R.
Monogram Industries, Inc.: *See*—
Pratt, John D., 4,548,533, Cl. 411-55.000.
Monroe, David R.: *See*—
D'Aniello, Michael J., Jr.; Monroe, David R.; and Krueger, Martin H., 4,548,911, Cl. 502-28.000.
Monsanto Company: *See*—
Donermeyer, Donald D.; Martins, Joseph J., deceased; and Martins, Joseph C., executor, 4,548,996, Cl. 525-420.500.
Montague, John M.: *See*—
Files, James H.; and Montague, John M., 4,548,151, Cl. 114-219.000.
Montanari, Fernando: *See*—
Dalcanale, Enrico; Bottaccio, Giorgio; Campolmi, Stefano; and Montanari, Fernando, 4,549,025, Cl. 546-327.000.
Montedison S.p.A.: *See*—
Dalcanale, Enrico; Bottaccio, Giorgio; Campolmi, Stefano; and Montanari, Fernando, 4,549,025, Cl. 546-327.000.
Garagnani, Enea; Moro, Alessandro; and Marzola, Roberto, 4,548,993, Cl. 525-195.000.
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Castelein, Jean, 4,548,988, Cl. 525-71.000.
Montefiore Hospital: *See*—
Stanko, Ronald T., 4,548,937, Cl. 514-251.000.
Montfort, John G.: *See*—
Baskins, Lowell L.; Keene, James M.; and Montfort, John G., 4,549,080, Cl. 250-343.000.
Montgomery, Gary V., to Sunbeam Plastics Corporation. Child resistant dispensing closure. 4,548,331, Cl. 220-253.000.
Moon, Jerry W. Refuse compactor. 4,548,132, Cl. 100-52.000.
Moore, Carroll E.: *See*—
Lenertz, John B.; and Moore, Carroll E., 4,548,543, Cl. 414-686.000.
Moore, Donald M. Synchronized folding knife. 4,547,965, Cl. 30-153.000.
Moore, Richard B., to Polysar Financial Services S.A. Asphalt emulsion. 4,548,966, Cl. 524-53.000.
Moore Special Tool Co., Inc.: *See*—
Winski, Dennis A., 4,547,996, Cl. 51-165.710.
Moore, Stephen D.; and Maglio, Murrill. Chemical feeder. 4,548,228, Cl. 137-268.000.
Moorhead, Louise C.: *See*—
Armeniades, C. D.; and Moorhead, Louise C., 4,548,205, Cl. 128-748.000.
Moran, Kenneth T.: *See*—
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,548,737, Cl. 252-500.000.
Morander, Karl-Erik. Device for determining the real or the virtual distance of a source of light from a measuring plane. 4,548,504, Cl. 356-375.000.
Moren, John L.: *See*—
Crandell, William H.; Moren, John L.; and Ruona, Paul Q., 4,548,245, Cl. 141-237.000.
Moretto, Hans-Heinrich: *See*—
Steinberger, Helmut; Moretto, Hans-Heinrich; Michel, Werner; and Kniege, Wilfried, 4,548,999, Cl. 525-453.000.
Morgan, Fred K.: *See*—
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Mori, Hiroshi: *See*—
Yoshida, Tomohiko; and Mori, Hiroshi, 4,548,964, Cl. 523-455.000.
Mori, Taiichi: *See*—
Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, 4,548,625, Cl. 55-282.000.
Mori, Yasuharu: *See*—
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, 4,548,109, Cl. 83-71.000.
Moriarty, William L.: *See*—
Fletcher, Augustus; and Moriarty, William L., 4,548,791, Cl. 423-22.000.
Moriguchi, Haruhiko: *See*—
Yamamoto, Tadashi; and Moriguchi, Haruhiko, 4,549,221, Cl. 358-288.000.
Morikawa, Tatsumi; Osawa, Yoshio; Kawakami, Takao; and Yoshida, Naoki, to Yamato Scientific Co., Ltd. Fume hood. 4,548,128, Cl. 98-115.300.
Morimoto, Keisuke, to General Foods Corporation. Extrusion process for shrimp or crabmeat analog products using boiling gelling bath. 4,548,823, Cl. 426-104.000.
Morin, Claude P., to Immolding Establishment. Method for manufacturing an element having a curved surface from a rigid panel of a material of the "honeycomb" type and the product obtained. 4,548,665, Cl. 156-197.000.
Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Charging generator controlling device. 4,549,128, Cl. 322-99.000.
Morita, Koichi: *See*—
Matsuda, Kazuo; and Morita, Koichi, 4,548,036, Cl. 60-464.000.
Moriwaki, Hisayoshi: *See*—
Nakano, Kenji; Moriwaki, Hisayoshi; and Takahashi, Takao, 4,549,229, Cl. 360-8.000.
Morley, Robert E., Jr.: *See*—
Engebretson, A. Maynard; Morley, Robert E., Jr.; and Popelka, Gerald R., 4,548,082, Cl. 73-585.000.
Moro, Alessandro: *See*—
Garagnani, Enea; Moro, Alessandro; and Marzola, Roberto, 4,548,993, Cl. 525-195.000.
Moro, Shuji; and Tenmaya, Michio, to Ichikoh Industries Limited; and Honda Motor Co., Ltd. Automobile door mirror device having a buffer mechanism. 4,548,483, Cl. 350-635.000.
Moronaga, Yoshiharu: *See*—
Harada, Masasuke; and Moronaga, Yoshiharu, 4,547,979, Cl. 36-30.00R.
Morong, William H., III: *See*—
Bokil, Delip R.; and Morong, William H., III, 4,547,961, Cl. 29-602.00R.
Morris, Donald A. Dispenser apparatus for the contents of compressible and collapsible tubes. 4,548,337, Cl. 222-96.000.
Morris, Jeffrey D.; and Fuller, Robert A., to Cosden Technology, Inc. Apparatus for producing styrenic/alkenylnitrile copolymers. 4,548,788, Cl. 422-109.000.
Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., to General Electric Company. Ground and test arrangement for a ground fault circuit interrupter. 4,549,241, Cl. 361-45.000.
Morris-Sherwood, Betty J.; Brink, Edward C., Jr.; McCoy, David R.; and McEntire, Edward E., to Texaco Inc. Water base hydraulic fluid. 4,548,726, Cl. 252-75.000.
Morrone, Giuseppe. Number puzzle. 4,548,410, Cl. 273-153.00S.
Moses, Alan C.: *See*—
Carey, Martin C.; Moses, Alan C.; and Flier, Jeffrey S., 4,548,922, Cl. 514-4.000.
Mosley, Kenneth C. Transparency mount providing rotatable projection image. 4,548,486, Cl. 353-95.000.
Moss, Ernest. Holder for all items and the like. 4,548,375, Cl. 248-205.200.
Mosser, III: Benjamin H., to AMP Incorporated. Electrical terminal for wires of different gauges. 4,548,459, Cl. 339-97.00P.
Mosser, Mark F.; and Fabiny, William J., to Sermatech International Incorporated. Thixotropic coating compositions and methods. 4,548,646, Cl. 106-14.120.
Mossman, Peter: *See*—
Evans, Dain S.; Georgiou, George A.; Mossman, Peter; Mukherjee, Arabinda; and Whiscombe, John B., 4,548,466, Cl. 350-96.200.
Motegi, Masahiko: *See*—
Ono, Masaaki; Motegi, Masahiko; and Okabe, Kazuo, 4,548,855, Cl. 428-147.000.
Motorola, Inc.: *See*—
Hing, Samath; and Guillien, Michel, 4,549,129, Cl. 323-276.000.
McLaughlin, Michael J., 4,549,311, Cl. 455-277.000.
Sood, Lal C., 4,549,101, Cl. 307-443.000.
Tobin, Philip J., 4,548,654, Cl. 148-1.500.
Welk, John R., 4,549,172, Cl. 340-703.000.
Motte, Jean-Pierre; and Maurer, Ghislain, to Institute de Recherches de la Siderurgie Francaise (IRSID); and Clecim. Direct-current electric-arc furnace and method of operating same. 4,549,301, Cl. 373-108.000.
Moura, Michael; Gonsalves, Lenine; and Fain, Gilbert, to Kelmar Marine Inc. Personal ocean security system. 4,549,169, Cl. 340-539.000.
Mourier, Georges, to Thomson-CSF. VHF radioelectric wave generator. 4,549,111, Cl. 315-4.000.
Moyle, Ronald W.: *See*—
Andrews, William H.; Milne, David J.; Moyle, Ronald W.; and Peters, James P., 4,548,795, Cl. 423-126.000.
MSK-Verpackungs-Systeme Gesellschaft mit beschrankter Haftung: *See*—
Hannen, Reiner W., 4,548,578, Cl. 431-350.000.
MTU Friedrichshafen GmbH: *See*—
Dinger, Hans; and Klotz, Helmut, 4,548,039, Cl. 60-606.000.
Kamleitner, Ewald, 4,548,182, Cl. 123-501.000.
MTU Motorn-und Turbinen Union GmbH: *See*—
Huther, Werner, 4,548,125, Cl. 92-187.000.
Muchowski, Joseph M.; Greenhouse, Robert; Ackrell, Jack; Li, Tsung-Tee; and Pfister, Jurg R., to Syntex (U.S.A.) Inc. +2-[(3,4-Methylenedioxy)phenethyl]-5-[(3-carboxamido-4-hydroxy)-α-hydroxybenzyl]pyrrolidines. 4,548,949, Cl. 514-422.000.
Muchowski, Joseph M.; and Ackrell, Jack, to Syntex (U.S.A.) Inc. Hypotensive benzoxathiole pyrrolidines. 4,548,951, Cl. 514-522.000.
Mueller, Karl F.; and Heiber, Sonia J., to Ciba-Geigy Corporation. Crosslinked, porous polymers for controlled drug delivery. 4,548,990, Cl. 525-123.000.
Muir, Colin W. A., to Johannesburg Consolidated Investment Company Limited. Treating cyanide-containing effluents. 4,548,718, Cl. 210-719.000.
Mukaida, Yoshito: *See*—
Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, 4,548,873, Cl. 428-695.000.
Mukherjee, Arabinda: *See*—
Evans, Dain S.; Georgiou, George A.; Mossman, Peter; Mukherjee, Arabinda; and Whiscombe, John B., 4,548,466, Cl. 350-96.200.
Mulch, Herbert: *See*—
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Mullen, George B.: *See*—
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Muller, Friedemann: *See*—
Bauer, Wolfgang; Lindner, Christian; Muller, Friedemann; Kress, Hans-Jurgen; Zabrocki, Karl; and Buekers, Josef, 4,548,987, Cl. 525-67.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. Pyrimidinecarbamate derivatives as intermediates. 4,549,019, Cl. 544-321.000.

Muller, Michael F.; and Ferry, John D., to Wisconsin Alumni Research Foundation. Preparation of protein films. 4,548,736, Cl. 252-315.100.

Multiform Desiccants, Inc.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,548,322, Cl. 206-526.000.

Mummey, Dale B.; and Plotts, Alan E., to AMP Incorporated. Right angle coaxial plug connector. 4,548,453, Cl. 339-17.00C.

Munk, Ulrich B.: *See*—
John, Heinrich R.; and Munk, Ulrich B., 4,548,461, Cl. 339-217.00R.

Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., to International Flavors & Fragrances Inc. Insect repellent, pheremonal, animal repellent, diagnostic or aroma enhancing compositions containing poly(epsilon caprolactone) having embedded therein functional substances. 4,548,764, Cl. 261-75.000.

Murakami, Mitsuharu: *See*—
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.

Murakami, Saburo: *See*—
Satoh, Susumu; Mogi, Kinichi; Murakami, Saburo; and Nakashima, Toshiaki, 4,548,753, Cl. 260-410.000.

Murasaki, Ryuichi: *See*—
Yoshida, Hiroshi; and Murasaki, Ryuichi, 4,548,116, Cl. 83-444.000.

Murata Kikai Kabushiki Kaisha: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,547,955, Cl. 29-568.000.

Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, to Hitachi Zosen Corporation. Double hulled ship with longitudinal reinforcements. 4,548,154, Cl. 114-355.000.

Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,548,954, Cl. 521-52.000.

Murphy, David A.; and Spellar, Peter C., to Frick Company. Microprocessor control of compression ratio at full load in a helical screw rotary compressor responsive to compressor drive motor current. 4,548,549, Cl. 417-53.000.

Murray, John E. Roof for a mobile home or the like. 4,548,002, Cl. 52-22.000.

Myers, Robert H. Mobile camping apparatus. 4,548,438, Cl. 296-160.000.

N. A. Taylor Company, Inc.: *See*—
Huang, Jiann-Yu, 4,549,070, Cl. 219-269.000.

Nabika, Kouichi: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,547,955, Cl. 29-568.000.

Nabulon, Werner: *See*—
Wirz, Armin; and Nabulon, Werner, 4,548,366, Cl. 242-18.0DD.

NACAM: *See*—
Haldric, Bernard; and Baudon nee Chardon, Sylvie, 4,548,591, Cl. 464-89.000.

NAF Controls AB: *See*—
Hagglund, Tore; and Astrom, Karl J., 4,549,123, Cl. 318-610.000.

Nagae, Yoshiharu; and Kawakami, Hideaki, to Hitachi, Ltd. Information holding device. 4,548,474, Cl. 350-333.000.

Nagai, Hirosi; and Nishimura, Yasushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Hydroxyapatite, ceramic material and process for preparing thereof. 4,548,959, Cl. 523-115.000.

Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, to Toda Kogyo Corp. Plate-like barium ferrite particles for use in magnetic recording and process for producing the same. 4,548,801, Cl. 423-594.000.

Nagaishi, Hiromi: *See*—
Hotta, Masao; Maio, Kenji; and Nagaishi, Hiromi, 4,549,166, Cl. 340-347.0DA.

Nagano, Susumu: *See*—
Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, 4,548,777, Cl. 264-107.000.

Nagaoka, Yoshitomi: *See*—
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Nagashima, Akira, to Kioritz Corporation. Carburetor chamber. 4,548,169, Cl. 123-195.00C.

Nagashima, Nao: *See*—
Sue, Yasuhiko; Ariga, Masao; Tamura, Yasuyuki; Nagashima, Nao; Miyagi, Ken; Nakaoka, Masaki; and Suda, Masashi, 4,549,219, Cl. 358-257.000.

Nagashino, Ayaji, to Japan Tobacco & Salt Public Corporation, The. Method and apparatus for unpacking a box packed with compressed material. 4,548,539, Cl. 414-412.000.

Nagata, Takayoshi; and Hashiyama, Mitsuaki, to Toyo Tire & Rubber Co., Ltd. Tire tread rubber composition. 4,548,980, Cl. 524-495.000.

Nagata, Toru, to Canon Kabushiki Kaisha. One-way clutch and winding and rewinding device for camera using the same. 4,548,304, Cl. 192-46.000.

Nagubandi, Sreeramulu, to Stauffer Chemical Company. Preparation of phosphonomethylated amino acids. 4,548,758, Cl. 260-502.50F.

Nagubandi, Sreeramulu, to Stauffer Chemical Company. Preparation of phosphonomethylated amino acids. 4,548,759, Cl. 260-502.50F.

Nagubandi, Sreeramulu, to Stauffer Chemical Company. Process for preparing phosphonomethylated amino acids. 4,548,760, Cl. 260-502.50F.

Naka, Ryoichi: *See*—
Suemitsu, Yukimasa; Nakajima, Kazutsugu; Naka, Ryoichi; and Goshi, Hiroo, 4,548,685, Cl. 204-146.000.

Nakajima, Kazutsugu: *See*—
Suemitsu, Yukimasa; Nakajima, Kazutsugu; Naka, Ryoichi; and Goshi, Hiroo, 4,548,685, Cl. 204-146.000.

Nakajima, Koji: *See*—
Yabumoto, Toshio; Sakaoka, Hiromu; and Nakajima, Koji, 4,548,173, Cl. 123-308.000.

Nakajima, Shiro: *See*—
Koshino, Yoshinori; and Nakajima, Shiro, 4,548,301, Cl. 188-196.00C.

Nakajima, Toshiyuki: *See*—
Rokunohe, Mitsuru; Nakajima, Toshiyuki; Iwata, Kansei; and Tajima, Hiroyuki, 4,549,175, Cl. 340-794.000.

Nakajima, Yasuo: *See*—
Yamamoto, Yoshiharu; Nakajima, Yasuo; and Nagaoka, Yoshitomi, 4,548,480, Cl. 350-432.000.

Nakamichi Corporation: *See*—
Minamishima, Mamoru, 4,549,255, Cl. 363-26.000.

Nakamura, Fumiaki: *See*—
Kubo, Sanae; and Nakamura, Fumiaki, 4,548,811, Cl. 424-71.000.

Nakamura, Katutoshi: *See*—
Kanaoka, Takeshi; Nakamura, Katutoshi; and Shimizu, Shigehisa, 4,548,492, Cl. 355-50.000.

Nakamura, Masato; and Takemoto, Sohei, to Sony Corporation. Digital video tape recorder that can be used with different television systems. 4,549,224, Cl. 358-310.000.

Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, to Victor Company of Japan, Ltd.; and Tokuyama Sekisui Industry Corporation, Ltd. High density information records made of conductive resin compositions comprising a specifically-treated vinyl chloride-base resin. 4,548,739, Cl. 252-511.000.

Nakamura, Toshiteru, to Sony Corporation. Apparatus for controlling the scrolling rate of a video display. 4,549,173, Cl. 340-726.000.

Nakane, Katsumi: *See*—
Araki, Hidejiro; Nakane, Katsumi; and Otani, Susumu, 4,548,029, Cl. 57-267.000.

Nakano, Kenji; Moriwaki, Hisayoshi; and Takahashi, Takao, to Sony Corporation. Method and apparatus for compensating for tape jitter during recording and reproducing of a video signal and PCM audio signal. 4,549,229, Cl. 360-8.000.

Nakano, Takayuki: *See*—
Sakashita, Takeshi; and Nakano, Takayuki, 4,548,689, Cl. 204-159.230.

Nakano, Yoshiyuki: *See*—
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.

Nakaoka, Masaki: *See*—
Sue, Yasuhiko; Ariga, Masao; Tamura, Yasuyuki; Nagashima, Nao; Miyagi, Ken; Nakaoka, Masaki; and Suda, Masashi, 4,549,219, Cl. 358-257.000.

Nakashima, Toshiaki: *See*—
Satoh, Susumu; Mogi, Kinichi; Murakami, Saburo; and Nakashima, Toshiaki, 4,548,753, Cl. 260-410.000.

Nakaso, Akishi; Yamanoi, Kiyoshi; Okamura, Toshiro; and Tsuru, Yoshiyuki, to Hitachi Chemical Company, Ltd. Electroless copper deposition solution. 4,548,644, Cl. 106-1.230.

Nakata, Junji: *See*—
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, 4,548,617, Cl. 51-293.000.

Nakata, Yasushi: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.

Nakatsuyama, Takashi: *See*—
Teranishi, Hiroshi; Nakatsuyama, Takashi; and Inagaki, Masaomi, 4,549,233, Cl. 360-90.000.

Nakayama, Masatoshi; and Izumi, Toshiaki, to TDK Corporation. Magnetic recording medium having an organic metal underlayer. 4,548,864, Cl. 428-336.000.

Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material. 4,548,899, Cl. 430-558.000.

Nalco Chemical Company: *See*—
Brown, William B.; and Davis, Cynthia E., 4,548,967, Cl. 524-56.000.

Nalewajek, David; Soriano, David S.; and Borowski, Ralph J., to Allied Corporation. Preparation of vinylphosphonate diesters. 4,548,763, Cl. 260-989.000.

Nalewajek, David; Eibeck, Richard E.; and Sukornick, Bernard, to Allied Corporation. High energy density battery with cathode composition. 4,548,881, Cl. 429-194.000.

Namba, Yoshiharu, to Rank Xerox Limited. Paper sorting apparatus for a copier. 4,548,402, Cl. 271-290.000.

Namikawa, Kazuhira: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.

Namiki, Yasuomi, to Victor Company of Japan, Ltd. Signal reproducing apparatus having means for modifying a pre-recorded control signal. 4,549,231, Cl. 360-14.200.

Nanda, Ashok K.; Silveri, Luigi; and McCool, Michael A., to Beloit Corporation. Method and apparatus for deinking. 4,548,673, Cl. 162-4.000.

Narita, Kohji: *See*—
Kozuka, Masayoshi; Mizutani, Tomihiko; and Narita, Kohji, 4,548,843, Cl. 428-31.000.

Naske, Marcel, to Helix Collector Syndicate. Perforated trough conditioning device. 4,548,623, Cl. 55-233.000.

National Distillers and Chemical Corpooration: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,548,865, Cl. 428-379.000.

National Nuclear Corporation Limited: *See*—
Hayden, Owen, 4,547,944, Cl. 29-402.090.

Naudot, Jean-Claude: *See*—
Fleurance, Claude; and Naudot, Jean-Claude, 4,549,285, Cl. 367-60.000.

Naumann, Ted F., Jr.: *See*—
Thompson, Craig R.; and Naumann, Ted F., Jr., 4,548,374, Cl. 248-123.100.

Naumenko, Viktor D.: *See*—
Vorobiev, Ivan Y.; Zharnov, Viktor M.; and Naumenko, Viktor D., 4,548,165, Cl. 123-41.840.

Nauth, Hans-Georg: *See*—
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.

Navarre, Francois-Pierre: *See*—
Lonchamp, Daniel; Hoai, Vong N.; and Navarre, Francois-Pierre, 4,548,615, Cl. 44-1.00D.

NCR Corporation: *See*—
Wirth, Robert L.; and Wilson, Hillis L., 4,548,521, Cl. 400-124.000.

Neat, Benjamin C. Tamperproof plastic container. 4,548,332, Cl. 220-268.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Detecting the temperature of moulds of a glassware forming machine of the individual section type. 4,548,633, Cl. 65-29.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Cooling articles of newly moulded glassware. 4,548,635, Cl. 65-84.000.

Nebon, Jean-Pierre; Barnel, Pierre; Denis, Robert; and Bertrand, Claude, to Merlin Gerin. Molded case circuit breaker with cooling and protection for the static tripping unit. 4,549,242, Cl. 361-115.000.

NEC Corporation: *See*—
Fukuchi, Hiromichi; and Ushioda, Toyoji, 4,549,191, Cl. 346-140.00R.
Fushikida, Katsunobu, 4,549,305, Cl. 375-27.000.
Kamijo, Atsushi; and Igarashi, Hitoshi, 4,549,059, Cl. 219-56.210.
Tsuge, Hisanao; and Yoshida, Takayoshi, 4,548,834, Cl. 427-63.000.
Yoshida, Yasuharu, 4,549,142, Cl. 329-50.000.

Nederlandse Organisatie Voor Zuiver-Wetenschappellik Ondebzoek (zwo): *See*—
Geus, John W.; and de Jong, Krijn P., 4,548,921, Cl. 502-330.000.

Negishi, Masataka. Plate for removing surface reflection out of the visual fields. 4,548,472, Cl. 350-276.00R.

Nelen, Petrus R., to Agfa-Gevaert N.V. Object-holding device of sucker cup type and sheet dispensing apparatus incorporating such device. 4,548,396, Cl. 271-90.000.

Nelson, Duane M., to Minnesota Mining and Manufacturing Company. Dual catheter and method for separately withdrawing fluids from the human heart. 4,548,597, Cl. 604-43.000.

Nelson, John A.; and Banks, Joan D., to Whirlpool Corporation. Method and means for inhibiting corrosion in a heat pipe. 4,548,258, Cl. 165-1.000.

Nemoto, Yuhei; Shigeta, Sadaaki; and Yokokawa, Yoshio, to Dainippon Ink and Chemicals, Inc. Optical recording medium. 4,548,889, Cl. 430-273.000.

Ness, Richard A. Induction heating device for nozzles of containers. 4,549,051, Cl. 219-10.49R.

Netsky, Margaret. Patient's gown. 4,547,907, Cl. 2-114.000.

Neu, Joseph: *See*—
Liesch, Jean; Metzdorf, Jacques; Meyers, Andre ; Neu, Joseph; and Redo, Jean, 4,548,503, Cl. 356-373.000.

New Fibers International: *See*—
Gordy, John, 4,548,675, Cl. 162-26.000.

New York Telephone Company: *See*—
Ellison, Edward; and Gruber, Otto R., 4,548,448, Cl. 339-17.00C.

Newman, David J.: *See*—
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,548,974, Cl. 424-118.000.

Newman, LaRue S. Building panel construction. 4,548,007, Cl. 52-309.110.

Newman, Michael G.; and Carranza, Fermin A., Jr. Fluoride-coated dental floss. 4,548,219, Cl. 132-91.000.

Newman, Neil F.: *See*—
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; Foroulis, Z. Andrew; and Baldwin, Francis P., 4,548,995, Cl. 525-354.000.

Niagara Machine & Tool Works: *See*—
Davis, Roy M., 4,548,095, Cl. 74-612.000.

Nicholas, Leo P.; and Nicholas, Robert J. Electrical discharge machining apparatus for producing threaded holes. 4,549,061, Cl. 219-69.00G.

Nicholas, Robert J.: *See*—
Nicholas, Leo P.; and Nicholas, Robert J., 4,549,061, Cl. 219-69.00G.

Nidola, Antonio; and de Nora, Oronzio, to Oronzio de Nora Impianti Elettrochimici S.p.A. Low oxygen overvoltage lead anodes. 4,548,697, Cl. 204-290.00R.

Nieh, Edward C. Y.: *See*—
McEntire, Edward E.; Knifton, John F.; Nieh, Edward C. Y.; and Sellstrom, Kathy B., 4,549,017, Cl. 544-168.000.

Nielsen, Bjarne M. Protecting device for transparencies. 4,548,487, Cl. 353-120.000.

Nielsen Moulding Design Corp.: *See*—
Sherman, Charles F., 4,547,986, Cl. 40-155.000.

Niemi, Bill H., to Medtronic, Inc. Automatic adjusting induction coil treatment device. 4,548,208, Cl. 128-419.00F.

Nighan, William L.; Wiegand, Walter J.; and Ferrar, Carl M., to United Technologies Corporation. Optical display with excimer fluorescence. 4,549,109, Cl. 313-485.000.

Niimura, Yoshihisa; and Shimamura, Shin, to Sanyo Denki Co., Ltd. Motor of the permanent-magnet rotor type. 4,549,104, Cl. 310-67.00R.

Nilsson, Erik A., to GKN-Stenman AB. Cylinder-lock attachment means. 4,548,061, Cl. 70-370.000.

Nilsson, Lennart C. O. Firearm system with cylinder bolt mechanism. 4,547,988, Cl. 42-16.000.

Ninomiya, Masakazu; and Fujimoto, Masaya, to Nippondenso Co., Ltd. Air-fuel ratio control system. 4,548,179, Cl. 123-440.000.

Nippon Cable System, Inc.: *See*—
Kobayashi, Tetuo; and Hirai, Syoichi, 4,547,993, Cl. 49-352.000.

Nippon Electric Co., Ltd.: *See*—
Kaneko, Takashi, 4,549,151, Cl. 332-9.00R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Fushiki, Tatsuo, 4,549,098, Cl. 307-352.000.
Wachi, Masatada; and Katoh, Mitsumi, 4,548,119, Cl. 84-1.190.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ikeda, Yoshiyuki; Inoue, Atsuo; and Ikeda, Kenjiro, 4,548,660, Cl. 149-21.000.

Nippon Kogaku K.K.: *See*—
Yamada, Kenji, 4,548,481, Cl. 350-559.000.

Nippon Light Metal Company Limited: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,548,682, Cl. 204-35.100.

Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,549,034, Cl. 17-17.0LF.

Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,548,558, Cl. 418-83.000.

Nippon Rubber Co., Ltd.: *See*—
Harada, Masasuke; and Moronaga, Yoshiharu, 4,547,979, Cl. 36-30.00R.

Nippon Sheet Glass Co., Ltd.: *See*—
Shibaoka, Kazuo; Onishi, Shunji; Miwa, Takao; and Akimoto, Toshio, 4,548,634, Cl. 65-79.000.
Tanaka, Keihachiro; and Yoshii, Shigekazu, 4,548,632, Cl. 65-5.000.

Nippon Steel Corporation: *See*—
Kimoto, Tetsuo; Orita, Kiyoshi; and Kuroki, Katsuro, 4,548,656, Cl. 148-111.000.
Suemitsu, Yukimasa; Nakajima, Kazutsugu; Naka, Ryoichi; and Goshi, Hiroo, 4,548,685, Cl. 204-146.000.

Nippon Zeon Co., Ltd.: *See*—
Tsuji, Takashi, 4,548,550, Cl. 417-390.000.

Nippondenso Co., Ltd.: *See*—
Ninomiya, Masakazu; and Fujimoto, Masaya, 4,548,179, Cl. 123-440.000.
Shiga, Tsutomu, 4,549,103, Cl. 310-60.00R.
Yamada, Takashi; and Shimamoto, Mamoru, 4,549,099, Cl. 307-359.000.

Nishida, Mitsuhiro: *See*—
Yamamoto, Sakuei; Nishida, Mitsuhiro; Inao, Hiroshi; Tashiro, Noboru; and Hani, Kiyoshi, 4,549,105, Cl. 310-87.000.

Nishida, Takeshi; Yamagami, Yousuke; Takeda, Toshihide; and Saito, Toshio, to Kanebo, Ltd. Heat retaining article. 4,547,906, Cl. 2-93.000.

Nishikawa, Kohei: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,548,932, Cl. 514-211.000.

Nishikawa, Masaji, to Olympus Optical Company Ltd. Sheet feed apparatus. 4,548,401, Cl. 271-265.000.

Nishikawa, Masao; and Sakai, Shinzou, to Honda Giken Kogyo Kabushiki Kaisha. Control device for direct clutch in automatic transmission. 4,548,307, Cl. 192-0.076.

Nishimoto, Masato, to Fuji Xerox Co., Ltd. Data retransmitting system. 4,549,297, Cl. 371-33.000.

Nishimura, Yasushi: *See*—
Nagai, Hirosi; and Nishimura, Yasushi, 4,548,959, Cl. 523-115.000.

Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,548,183, Cl. 123-547.000.
Tachibana, Akira; and Kiyoto, Masami, 4,549,181, Cl. 340-904.000.

Nissan Shatai Company, Limited: *See*—
Sunohara, Akira, 4,548,838, Cl. 427-282.000.

Nisshin Oil Mills, Ltd., The: *See*—
Higaki, Yuzo; and Ukai, Akitoshi, 4,549,009, Cl. 528-301.000.

Nissin Kogyo Kabushiki Kaisha: *See*—
Mizusawa, Mitutoyo; and Fujisawa, Masao, 4,548,445, Cl. 303-22.00A.

Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, to Goodyear Tire & Rubber Company, The. Self-alignment apparatus for molds of a tire vulcanizing press. 4,548,564, Cl. 425-32.000.

Noack, Hans-Herbert: *See*—
Mockesch, Erich; and Noack, Hans-Herbert, 4,548,321, Cl. 206-525.000.

Nobuhara, Masahiro; Yamaguchi, Kiyoshi; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Method of interferon production. 4,548,900, Cl. 435-68.000.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel clutch actuator. 4,548,370, Cl. 242-211.000.

Noda, Yuji: *See*—
Kitamura, Takashi; Fukuura, Yukio; Tanuma, Itsuo; Shinogaya, Toshikazu; and Noda, Yuji, 4,548,687, Cl. 204-159.170.

Noguchi, Kiyoshi: *See*—
Kobayashi, Kouji; Noguchi, Kiyoshi; and Takayama, Suguru, 4,548,871, Cl. 428-593.000.

Nomaki, Koji; Mase, Hiroshi; Sato, Yasuo; and Iga, Motoichi, to Asahi Glass Company Ltd. Process for producing a flat glass on a molten metal bath. 4,548,636, Cl. 65-99.200.

Nomura, Hirokazu: *See*—
Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,548,867, Cl. 428-409.000.

Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. AC elevator control system. 4,548,299, Cl. 187-29.00R.

Nomura, Yoshihisa; Katagiri, Masayoshi; and Sakakibara, Shigemi, to Toyota Jidosha Kabushiki Kaisha. Intermediate-lever device for a parking brake system. 4,548,093, Cl. 74-512.000.

Norley, Ronald R.; Sendelweck, Gene K.; and Chen, Keming J., to RCA Corporation. On-screen display. 4,549,218, Cl. 358-243.000.

North American Philips Corporation: *See*—
Chan, Albert Y., 4,549,288, Cl. 369-48.000.

Northern Telecom Limited: *See*—
Charlebois, Leonard J.; and Anderson, James E., 4,549,039, Cl. 174-72.00R.
Weirich, Andreas H.; and Strawczynski, Leo, 4,549,304, Cl. 375-27.000.

Norton, Charles J.; Falk, David O.; and Hill, Alfred D., to Marathon Oil Company. Oil recovery process using a polymer gel. 4,548,272, Cl. 166-295.000.

Norton, Peter. Motion converter for use in transducers and the like. 4,548,091, Cl. 74-99.00R.

Nousak, Matthew J. A., to Damco Testers, Inc. Pipe testing tool. 4,548,069, Cl. 73-49.500.

Noxon, Arthur M. Reflective acoustical damping device for rooms. 4,548,292, Cl. 181-295.000.

Nozawa, Ryoichiro; Kiya, Nobuyuki; and Ichimura, Akio, to Fanuc Limited. Measurement method by numerical control device. 4,549,271, Cl. 364-474.000.

Nyman, Bror G.: *See*—
Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., 4,548,765, Cl. 261-93.000.

O. G. Hoyer A/S: *See*—
Waldstrom, Ejvind, 4,548,573, Cl. 425-442.000.

Obara, Shin: *See*—
Kaneko, Nagao; Fujimori, Yoshinori; Shimizu, Seizaburo; and Obara, Shin, 4,549,107, Cl. 310-327.000.

Oberly, Jesse A.: *See*—
Mitchell, Jerry L.; and Oberly, Jesse A., 4,548,824, Cl. 426-111.000.

O'Brien, John G.: *See*—
Irvine, Robert; O'Brien, John G.; and Luperti, Harry E., 4,548,393, Cl. 270-59.000.

Occhialini, Giorgio; Grazia, Gabrio; and Forlani, Fausto, to Mac-Pack S.R.L. Device for forming batches of box shaped products in side by side rows in particular out of supply line infed parcels liable to lose their shape. 4,548,313, Cl. 198-430.000.

Odaka, Kentaro, to Sony Corporation. Redundantly and asynchronously recording an information signal. 4,549,230, Cl. 360-8.000.

Officine Savio SpA: *See*—
Ravinale, Stefano; and Vernocchi, Vittorio, 4,548,518, Cl. 384-490.000.

Ogata, Shoji: *See*—
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,549,163, Cl. 340-52.00R.

Ogawa, Kenji: *See*—
Kubotera, Hiroshi; Ogawa, Kenji; and Hatakeyama, Kenji, 4,548,537, Cl. 414-276.000.

Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Element for electrophoresis. 4,548,869, Cl. 428-474.700.

Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Element for electrophoresis. 4,548,870, Cl. 428-474.700.

Ogawa, Masazo: *See*—
Shimohiro, Yoshiyuki; Ogawa, Masazo; and Ohnishi, Tooru, 4,548,648, Cl. 106-208.000.

Oge, Eray. Electrically heated steering wheel cover. 4,549,069, Cl. 219-204.000.

Ogg, Richard K. Stacking chair. 4,548,441, Cl. 297-239.000.

Oguchi, Yoshihiro: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, 4,548,886, Cl. 430-70.000.

Ogura, Masahiko: *See*—
Tanimoto, Yasufumi; and Ogura, Masahiko, 4,549,126, Cl. 318-696.000.

Ohara, Terumi: *See*—
Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; and Kiuchi, Tsutomu, 4,549,201, Cl. 358-13.000.

Ohara, Yuji, to Fuji Photo Film Co., Ltd. Light quantity compensation apparatus. 4,549,190, Cl. 346-108.000.

Ohgami, Masaaki: *See*—
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,549,163, Cl. 340-52.00R.

Ohhashi, Yasuo; Araki, Junichi; and Katsui, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Pulley construction. 4,548,592, Cl. 474-168.000.

Ohmstede Machine Works, Inc.: *See*—
Ohmstede, Robert L., 4,547,963, Cl. 29-726.000.

Ohmstede, Robert L., to Ohmstede Machine Works, Inc. Apparatus and method for inserting tubes into a heat exchanger frame. 4,547,963, Cl. 29-726.000.

Ohnishi, Tooru: *See*—
Shimohiro, Yoshiyuki; Ogawa, Masazo; and Ohnishi, Tooru, 4,548,648, Cl. 106-208.000.

Oil Drive Kogyo, Ltd.: *See*—
Hasegawa, Kisaku, 4,548,296, Cl. 187-17.000.

Oka, Yasuo: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,548,682, Cl. 204-35.100.

Okabe, Kazuo: *See*—
Ono, Masaaki; Motegi, Masahiko; and Okabe, Kazuo, 4,548,855, Cl. 428-147.000.

Okada, Takanori. Method of and apparatus for sewing towel fabric end. 4,548,146, Cl. 112-262.300.

Okada, Toshiteru: *See*—
Miyazaki, Kazuhide; Kitamura, Yasuo; and Okada, Toshiteru, 4,548,684, Cl. 204-130.000.

Okahata, Yoshio; and Seki, Tokahiro, to Sogo Pharmaceutical Company Limited. Nylon capsule responding to pH. 4,548,955, Cl. 521-53.000.

Okamoto, Takanori: *See*—
Doi, Hidemi; Okamoto, Takanori; and Matsuda, Hideaki, 4,548,992, Cl. 525-167.000.

Okamura, Toshihisa: *See*—
Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, 4,548,873, Cl. 428-695.000.

Okamura, Toshiro: *See*—
Nakaso, Akishi; Yamanoi, Kiyoshi; Okamura, Toshiro; and Tsuru, Yoshiyuki, 4,548,644, Cl. 106-1.230.

Okano, Kazuo: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.

Okatsuka, Hisashi; Taniguchi, Koichi; and Kakizawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electromagnetic induction heating apparatus capable of heating nonmagnetic cooking vessels. 4,549,056, Cl. 219-10.770.

Okazaki, Yasushi: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.

Okita, Tsutomu: *See*—
Hashimoto, Hiroshi; and Okita, Tsutomu, 4,548,833, Cl. 427-44.000.

Okura Koygo Kabushiki Kisha: *See*—
Doi, Hidemi; Okamoto, Takanori; and Matsuda, Hideaki, 4,548,992, Cl. 525-167.000.

Olin Corporation: *See*—
Kadija, Igor V.; and Justice, David D., 4,548,693, Cl. 204-252.000.
Miles, Ronald C., 4,548,694, Cl. 204-257.000.
Raynor, Robert J., 4,548,973, Cl. 524-102.000.
Weaver, Otha G., Jr., 4,548,696, Cl. 204-290.00R.

Oliver, Arthur B., to Texas Instruments Incorporated. Push pull output RC oscillator with frequency compensation. 4,549,150, Cl. 331-111.000.

Olivieri, Oliviero, to Icaro Olivieri & C.S.p.A. Sprocket device for the fastening of ski-boots. 4,547,980, Cl. 36-50.000.

Olmsted, John D.: *See*—
LaPointe, Raymond L.; and Olmsted, John D., 4,549,269, Cl. 364-472.000.

Olson, Harold J.: *See*—
Lerner, Edward M.; and Olson, Harold J., 4,549,274, Cl. 364-492.000.

Olson, Leonard T.: *See*—
Ecker, Mario E.; and Olson, Leonard T., 4,549,200, Cl. 357-80.000.

Olsson, Bertil: *See*—
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,548,187, Cl. 123-557.000.

Olsson, Gunnar: *See*—
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,548,187, Cl. 123-557.000.

Olsson, John; Olsson, Bertil; and Olsson, Gunnar, to J-Jet Konstruktions. Internal combustion engine for alternative fuels. 4,548,187, Cl. 123-557.000.

Oltarzewski, Edward S.: *See*—
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,548,764, Cl. 261-75.000.

Olympus Optical Co., Ltd.: *See*—
Kinoshita, Kunio, 4,548,197, Cl. 128-4.000.
Kusazaki, Yoshimasa, 4,549,131, Cl. 323-354.000.
Nishikawa, Masaji, 4,548,401, Cl. 271-265.000.

Tezuka, Sadao; Tanaka, Yasuhiko; Matsumura, Kunihiko; Yamamoto, Tadao; Suzuki, Nobuyoshi; and Tsurukawa, Toshio, 4,548,259, Cl. 165-14.000.
Onishi, Hisaaki: *See*—
Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, 4,548,564, Cl. 425-32.000.
Onishi, Shunji: *See*—
Shibaoka, Kazuo; Onishi, Shunji; Miwa, Takao; and Akimoto, Toshio, 4,548,634, Cl. 65-79.000.
Ono, Kimizo, to Sumitomo Electric Industries, Ltd. Sensor for spectral analyzer for living tissues. 4,548,505, Cl. 356-445.000.
Ono, Masaaki; Motegi, Masahiko; and Okabe, Kazuo, to Toray Industries, Inc. Polyester film for magnetic recording medium. 4,548,855, Cl. 428-147.000.
Onoda, Hajime; and Arakawa, Kunio, to Kimmon Manufacturing Co., Inc. Flow meter. 4,548,084, Cl. 73-861.810.
Ontario Crippled Children's Centre: *See*—
Ginpil, Frederick D.; Milner, Morris; and Senders, John W., 4,547,918, Cl. 5-446.000.
Ontario Research Foundation: *See*—
Sweet, Edmund G. F., 4,548,080, Cl. 73-432.0SD.
Op de Beek, Johannes C. A.: *See*—
Deckers, Willem H. M.; and Op de Beek, Johannes C. A., 4,549,265, Cl. 364-414.000.
Opelika Manufacturing Corp.: *See*—
Heater, Charles P.; and Cooper, Bruce H., 4,548,595, Cl. 493-458.000.
Orban, Joseph N. Stud drive tool. 4,548,103, Cl. 81-53.200.
Orgenics Ltd.: *See*—
Herzberg, Max; and Fish, Falk, 4,549,011, Cl. 536-31.000.
Orita, Kiyoshi: *See*—
Kimoto, Tetsuo; Orita, Kiyoshi; and Kuroki, Katsuro, 4,548,656, Cl. 148-111.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Nidola, Antonio; and de Nora, Oronzio, 4,548,697, Cl. 204-290.00R.
Ortelli, Aurelio, to Riva Calzoni S.p.A. Radial piston hydraulic motor with variable eccentricity. 4,548,124, Cl. 92-12.100.
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Ozawa, Lyuji, to Matsushita Electric Industrial Co., Ltd. X-Ray imaging device for directly displaying X-ray images. 4,549,083, Cl. 250-458.100.
Ozawa, Takashi, to Fuji Xerox Co., Ltd. Original reading device. 4,549,088, Cl. 250-578.000.
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Ponsford, Roger J.; and Howarth, Thomas T., to Beecham Group p.l.c. Antibacterial agents. 4,548,815, Cl. 424-114.000.
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Press, Irving D.; and Lane, Charles S., to UMC Industries, Inc. Strain accommodating fluid conduit assembly and fitting therefor. 4,548,427, Cl. 285-55.000.
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Product Identification Corporation: *See*—
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Ramser, Robert A.; Booz, A. David; Barch, Daniel R.; and Cebulak, Walter S., to Aluminum Company of America. Method for the production of atomized metal particles. 4,548,768, Cl. 264-12.000.
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Kumar, Mahesh, 4,549,152, Cl. 332-23.00R.
Levine, Peter A., 4,549,215, Cl. 358-213.000.
Martinez, Miguel R.; and Mitchell, William J., Jr., 4,548,066, Cl. 73-1.00J.
Norley, Ronald R.; Sendelweck, Gene K.; and Chen, Keming J., 4,549,218, Cl. 358-243.000.
Savoye, Eugene D.; and Tomasetti, Charles M., 4,547,957, Cl. 29-572.000.
Sendelweck, Gene K., 4,549,217, Cl. 358-243.000.
Shanley, Robert L., II, 4,549,203, Cl. 358-34.000.
White, Allan E., 4,548,465, Cl. 350-96.200.
Woodward, Oakley M., 4,549,310, Cl. 455-129.000.
Read, William A. Device for preventing theft of motor vehicles. 4,549,090, Cl. 307-10.0AT.
Rebske, Gunter; and Voigt, Manfred, to VEB Kombinat Textima. Bearing housings for driven and air-suspended spinning rings on ring-spinning machines and ring-twisting machines. 4,548,028, Cl. 57-124.000.
Redo, Jean: *See*—
Liesch, Jean; Metzdorf, Jacques; Meyers, Andre; Neu, Joseph; and Redo, Jean, 4,548,503, Cl. 356-373.000.
Reed Lignin, Inc.: *See*—
DeBons, Francis E.; Whittington, Lawrence E.; and Pedersen, Larry D., 4,548,721, Cl. 252-8.55D.
Reed Rock Bit Company: *See*—
Daly, Jeffery E.; and Pastusek, Paul E., 4,548,280, Cl. 175-40.000.
Reese, Raymond E. Disposal vehicle loading apparatus. 4,548,542, Cl. 414-549.000.
Regner, Richard: *See*—
Romeike, Arno; Regner, Richard; and Weinheimer, Alois, 4,547,932, Cl. 17-45.000.
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Boulanger, Michelle, to Adir. Xanthine compounds. 4,548,820, Cl. 514-255.000.
Regunathan, Perialwar; Tadlock, John W.; and Jarog, Dean J., to Everpure, Inc. Chemical feeder device. 4,548,227, Cl. 137-268.000.
Reichbach, Morris M. Circular integrated circuit package. 4,549,036, Cl. 174-52.0FP.
Reid, John H. Conservation of momentum in a barrier oxidation ditch. 4,548,712, Cl. 210-194.000.
Reil, Wilhelm, to Tetra Pak Developpement S.A. Cutting device for a flexible web. 4,548,110, Cl. 83-176.000.
Reiling, Karl; and Reiling, Reinhold. Device for fixing a drill to be ground. 4,547,999, Cl. 51-219.00R.
Reiling, Reinhold: *See*—
Reiling, Karl; and Reiling, Reinhold, 4,547,999, Cl. 51-219.00R.
Reimann, Robert C.; and Root, Richard A., to United States of America, Energy. Direct fired absorption machine flue gas recuperator. 4,548,048, Cl. 62-238.300.
Reimels, Harry G., to Mentor O & O, Inc. Disposable coagulator. 4,548,207, Cl. 128-303.170.
Reimer, William A.; and Vonder, David L., to GTE Communication Systems Corporation. Terminal pin securing arrangement. 4,548,450, Cl. 339-17.00C.
Reina Briceno, Enrique. Ceiling suspension system. 4,548,013, Cl. 52-667.000.
Reinecke, Paul: *See*—
Holmwood, Graham; Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Scheinpflug, Hans, 4,548,945, Cl. 514-383.000.
Reiner, Martin J.; and Taylor, Kenneth E., to United Technologies Corporation. Mold with starter and selector sections for directional solidification casting. 4,548,255, Cl. 164-361.000.
Reinking, Klaus: *See*—
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,548,970, Cl. 524-98.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,549,006, Cl. 528-73.000.
Reisgies, Rolf W.; and Kvalo, Michael L., to Germania Dairy Automation, Inc. Milk weight metering method and apparatus. 4,548,161, Cl. 119-14.170.
Rekow, Vernon C., to Champion International Corporation. Mailing container and blank therefor. 4,548,323, Cl. 206-611.000.
Remes, R. Scott; and Thompson, Paul J., to Minnesota Valley Engineering, Inc. Liquid container. 4,548,335, Cl. 220-466.000.
Renfro, Don C. Spare tire securing apparatus. 4,548,540, Cl. 414-463.000.
Rengo Co., Ltd.: *See*—
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, 4,548,109, Cl. 83-71.000.
Renner, Alfred; Grutter, Peter; and Hugi, Rolf, to Ciba-Geigy Corporation. Novel tetraglycidyl ethers. 4,549,008, Cl. 528-220.000.
Renoulin, Roger J.; Lefranc, Jean P.; and Takhedmit, Tahar. Hybrid local communication network, operating both in circuit and packet modes. 4,549,291, Cl. 370-89.000.
Rensselaer Polytechnic Institute: *See*—
Roberts, Jack; and Johnson, Robert L., 4,547,910, Cl. 623-18.000.
Renzo, Folli; and Marino, Casadei. Automatic machine for forming and distributing bakery products of various shapes in baking tins. 4,548,566, Cl. 425-110.000.
Rey, S. Frank, to Exxon Research & Engineering Co. Epoxy resin compositions of enhanced creep resistance. 4,548,961, Cl. 523-220.000.

Reynolds, Desmond H. J.; Price, Anthony G.; and Campbell, Roy, to Lucas Industries Public Limited Company. Vehicle hydraulic braking system. 4,547,967, Cl. 303-7.000.
Rhein-Nadel Maschinennadel GmbH: *See*—
Lange, Horst, 4,548,251, Cl. 163-5.000.
Rheinmetall GmbH: *See*—
Janssen, Karl-Egon; and Breur, Heinz G., 4,548,121, Cl. 89-26.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,548,734, Cl. 252-311.000.
Lepage, Jean-Luc; and Soula, Gerard, 4,548,917, Cl. 502-150.000.
Rice, Gary W., to Exxon Research and Engineering Co. Laser synthesis of refractory oxide powders. 4,548,798, Cl. 423-263.000.
Rice, Richard E.: *See*—
Grady, John K.; and Rice, Richard E., 4,549,209, Cl. 358-111.000.
Richardson, David L.; Patterson, Peter M.; Clark, Jack P.; Stanton, Scott R.; and Perry, Richard W., to General Electric Company. Stub tube inspection device. 4,548,785, Cl. 376-249.000.
Richardson, Robert W.: *See*—
Berman, Samuel M.; and Richardson, Robert W., 4,549,110, Cl. 313-485.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.
Rickling, Arthur R. Portable gun holder case. 4,548,392, Cl. 269-156.000.
Ricoh Company, Ltd.: *See*—
Kawajiri, Yoshio, 4,549,239, Cl. 360-105.000.
Suzuki, Kazuhiro, 4,549,220, Cl. 358-283.000.
Riebel, Hans-Jochem; Eue, Ludwig; Faust, Wilfried; and Priesnitz, Uwe, to Bayer Aktiengesellschaft. N-Acyl-piperidone ketal compounds and their use as antidotes for protecting crop plants from herbicidal damage. 4,548,639, Cl. 71-94.000.
Riedesser, Walter: *See*—
Schneider, Werner; Pangritz, Dirk; and Riedesser, Walter, 4,548,677, Cl. 162-139.000.
Riediker, Martin; Rohde, Ottmar; Roth, Martin; and Buhler, Niklaus, to Ciba Geigy Corporation. Photopolymerizable compositions containing prepolymers with olefin double bonds and titanium metallocene photoinitiators. 4,548,891, Cl. 430-283.000.
Riemann, Herbert F. Handle for striking tool. 4,548,248, Cl. 81-22.000.
Rieter Machine Works, Ltd.: *See*—
Wirz, Armin; and Nabulon, Werner, 4,548,366, Cl. 242-18.0DD.
Riley, Donald J.: *See*—
Huang, Jen-chi; Von Gruenberg, Gregory; and Riley, Donald J., 4,548,683, Cl. 204-129.400.
Rinderle, James R.: *See*—
Suh, Nam P.; and Rinderle, James R., 4,548,773, Cl. 264-40.600.
Rinehart, Kenneth L., Jr., to University of Illinois, The Board of Trustees of the. Composition of matter and process. 4,548,814, Cl. 424-95.000.
Ring, Edward M. Intercostal tube. 4,548,602, Cl. 604-280.000.
Ring, Gerard J. F.: *See*—
Aberson, Gerard M.; and Ring, Gerard J. F., 4,548,847, Cl. 428-74.000.
Ringspean Albrecht Maurer, K.G.: *See*—
Maurer, Ruprecht, 4,548,316, Cl. 198-835.000.
Riou, Jean: *See*—
Bouadma, Noureddine; Bouley, Jean-Claude; and Riou, Jean, 4,547,956, Cl. 29-569.00L.
Ripley, Bernice D.: *See*—
Ripley, John F.; and Ripley, Bernice D., 4,549,252, Cl. 362-216.000.
Ripley, Donald E.: *See*—
Martin, John F.; and Ripley, Donald E., 4,548,115, Cl. 83-409.000.
Ripley, John F.; and Ripley, Bernice D. Outdoor lighting fixture. 4,549,252, Cl. 362-216.000.
Risko, Frank D.; and Lewis, Thomas D., to Ex-Cell-O Corporation. Electronic program control. 4,548,244, Cl. 141-156.000.
Ritson, Carl: *See*—
Danby, Hal C.; and Ritson, Carl, 4,548,023, Cl. 53-452.000.
Ritter, Hans-Joachim: *See*—
Hojer, Anke; Bockmann, Jurgen; Hofmann, Harald; Mikuteit, Axel; Ritter, Hans-Joachim; and Tenhagen, Rolf, 4,548,325, Cl. 211-69.500.
Riva Calzoni S.p.A.: *See*—
Ortelli, Aurelio, 4,548,124, Cl. 92-12.100.
Robbins Company, The: *See*—
Sugden, David B.; Waddell, Bruce A.; Kindsvater, James P.; and Moffat, Robert B., 4,548,442, Cl. 299-10.000.
Turner, John, 4,548,443, Cl. 299-31.000.
Robert Bosch GmbH: *See*—
Hofmann, Karl; and Jager, Erich, 4,548,356, Cl. 239-126.000.
Illetschko, Gerhard, 4,549,213, Cl. 358-167.000.
Laufer, Helmut; and Wessel, Wolf, 4,548,184, Cl. 123-569.000.
Paschke, Werner, 4,548,361, Cl. 239-585.000.
Roberts, Jack; and Johnson, Robert L., to Rensselaer Polytechnic Institute. Low friction bearing surfaces and structures particularly for artificial prosthetic joints. 4,547,910, Cl. 623-18.000.
Roberts, Joseph W., Sr. Self-flashing channeled skylight. 4,548,006, Cl. 52-200.000.
Roberts, Richard W., to Borg-Warner Corporation. Method of manufacturing a die-cast wobble plate assembly. 4,548,254, Cl. 164-112.000.
Roberts, Thomas G.; and Honeycutt, Thomas E., to United States of America, Army. Non-obstructing laser beam sampling meter. 4,548,496, Cl. 356-213.000.
Robertshaw Controls Company: *See*—
Wagner, Joseph P.; and Sliger, Boyd P., 4,548,354, Cl. 236-345.000.
Robertson, John A., to Burroughs Corporation. Printed circuit board edge connectors. 4,548,456, Cl. 339-75.0MP.
Rock-Tenn Company: *See*—
Engle, Donald W.; and Hahn, Roger S., 4,548,350, Cl. 229-15.000.
Rockwell International Corporation: *See*—
Brian, Michael, 4,549,165, Cl. 340-347.0CC.
McDermott, Thomas C., III, 4,549,283, Cl. 365-194.000.
Sheill, David D.; Davidson, Donald J.; and Dettloff, David J., 4,548,300, Cl. 188-73.100.
Spence, John R., 4,549,100, Cl. 307-362.000.
Vyhnal, Richard F., 4,548,065, Cl. 72-413.000.
Yeh, Pochi A., 4,548,479, Cl. 350-404.000.
Rodriguez, Domingo; Schemel, Roberto; and Salazar, Ramon, to Intevep, S.A. Method for precipitating vanadium from vanadium bearing liquors and recovering vanadium pentoxide. 4,548,792, Cl. 423-65.000.
Roelofs, Johannes C. M.: *See*—
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannes C. M., 4,548,129, Cl. 99-281.000.
Roger Bullivant Inc.: *See*—
Bullivant, Roger A., 4,548,526, Cl. 405-233.000.
Roggeveen, Hans D. H., to IHC Holland N.V. Hopper barge with bottom flaps and a suction channel. 4,548,147, Cl. 114-36.000.
Rohde, Ottmar: *See*—
Riediker, Martin; Rohde, Ottmar; Roth, Martin; and Buhler, Niklaus, 4,548,891, Cl. 430-283.000.
Rohm GmbH: *See*—
Scordialo, Angelo, 4,548,719, Cl. 210-732.000.
Rohm and Haas Company: *See*—
St. John, Frank; and Martin, Wayne, 4,548,879, Cl. 427-96.000.
Rokunohe, Mitsuru; Nakajima, Toshiyuki; Iwata, Kansei; and Tajima, Hiroyuki, to Dainichi-Nippon Cables, Ltd.; and Graphica Computer Corporation. Image transmission apparatus using a random arrangement of optical fibers. 4,549,175, Cl. 340-794.000.
Rolls-Royce Limited: *See*—
Maguire, Addison C., 4,548,034, Cl. 60-262.000.
Romada Holdings Ltd.: *See*—
Smith, Dennis C.; and Maijer, Rolf, 4,548,583, Cl. 433-228.100.
Romeike, Arno; Regner, Richard; and Weinheimer, Alois, to Hoechst Aktiengesellschaft. Process and apparatus for shirring tubular casings. 4,547,932, Cl. 17-45.000.
Root, Richard A.: *See*—
Reimann, Robert C.; and Root, Richard A., 4,548,048, Cl. 62-238.300.
Rosaen, Nils O. Fluid handling device. 4,548,235, Cl. 137-557.000.
Rossean, Larry D.: *See*—
Chung, Randall M.; and Rossean, Larry D., 4,549,262, Cl. 364-200.000.
Rossmann, Christian: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,548,729, Cl. 252-174.210.
Roszkowski, Margaret L.: *See*—
Castleman, Lawrence D., 4,547,915, Cl. 623-6.000.
Roth, Donald J.; Kubis, Charles S.; and Walter, John, to Continental Can Company, Inc. Combination machine for assembling container components. 4,548,668, Cl. 156-357.000.
Roth, Martin: *See*—
Riediker, Martin; Rohde, Ottmar; Roth, Martin; and Buhler, Niklaus, 4,548,891, Cl. 430-283.000.
Roussos, Josiane: *See*—
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,548,734, Cl. 252-311.000.
Roy, Gerald A., Jr.: *See*—
Hageman, Larry H.; and Roy, Gerald A., Jr., 4,548,638, Cl. 71-93.000.
Rozenwaig, Boris. Supervisory device for an optoelectronic switching network. 4,549,313, Cl. 455-600.000.
Rozmus, Walter J.; and Hochstein, Peter A., to Kelsey-Hayes Company. Assembly for filling a container. 4,548,020, Cl. 53-268.000.
Ruben, Lawrence M.: *See*—
Assael, David; and Ruben, Lawrence M., 4,549,211, Cl. 358-126.000.
Ruda, Jerome; and Ludwig, Vernon L., to Harris Manufacturing Corporation. Ladder for a boat and method of fabrication. 4,548,294, Cl. 182-206.000.
Ruddy, Donald C.: *See*—
Hicks, Irwin A.; and Ruddy, Donald C., 4,548,863, Cl. 428-325.000.
Ruegg, Heinz, to Huber Italia S.R.L. Plug type lock for briefcases. 4,548,059, Cl. 70-69.000.
Ruff, Robert O.: *See*—
King, Donald L.; Ruff, Robert O.; and Schwarz, Ernest D., II, 4,547,930, Cl. 16-382.000.
Ruhle, James L. Anti back-out steel coupling system for nonmetallic composite pipe. 4,548,428, Cl. 285-90.000.
Rulevsky, Evgeny V.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.
Runions, Alton E.: *See*—
Mayer, William; and Runions, Alton E., 4,548,589, Cl. 445-4.000.

Runzi, Kurt. Single-sheet separating apparatus, particularly for use with office machines. 4,548,397, Cl. 271-121.000.
Ruona, Paul Q.: *See—*
Crandell, William H.; Moren, John L.; and Ruona, Paul Q., 4,548,245, Cl. 141-237.000.
Rupp, Richard H.: *See—*
Beck, Gerhard; Bartmann, Wilhelm; Knolle, Jochen; and Rupp, Richard H., 4,548,936, Cl. 514-422.000.
Rusch, Randy A., to General Motors Corporation. Uses for buried contacts in integrated circuits. 4,547,959, Cl. 29-577.00C.
Ruschke, Ricky R., to Baxter Travenol Laboratories, Inc. Drip chamber assembly. 4,548,600, Cl. 604-122.000.
Rusteberg, Robert K., to Panlmatic Company. Valve assembly. 4,548,232, Cl. 137-519.000.
Rutgerswerke Aktiengesellschaft: *See—*
Orth, Winfried; Pastorek, Emmerich; and Fickert, Werner, 4,549,024, Cl. 546-320.000.
Rutledge, Myron J.: *See—*
Pietraszek, Mitchell E.; and Rutledge, Myron J., 4,548,189, Cl. 124-41.00A.
Rutledge, Raleigh N.: *See—*
Hahn, Granville J.; and Rutledge, Raleigh N., 4,548,570, Cl. 425-141.000.
Ruttenberg, Alexander; and Zur, Alexander, to T.M.B. Fertilizer Pumps Ltd. Fluid driven reciprocating pump capable of either single-action or double-action operation. 4,548,551, Cl. 417-393.000.
S & K Products Co. Inc.: *See—*
Mackey, Sherman E., Jr., 4,548,324, Cl. 211-58.000.
S.N.E.C.M.A.: *See—*
Lardellier, Alain M. J., 4,548,546, Cl. 415-133.000.
Saada, Charles; and Mollier, Jean, to Cii Honeywell Bull (Societe Anonyme). Method for certifying the origin of at least one item of information stored in the memory of a first electronic device and transmitted to a second electronic device, and system for carrying out the method. 4,549,075, Cl. 235-380.000.
Sabongi, Gebran J.; and Poon, Stephen S. C., to Minnesota Mining and Manufacturing Company. Dye-bleach materials and process. 4,548,896, Cl. 430-332.000.
Saccoccia, Pasqualino, to Euro California, Inc. Mobile hoist. 4,548,387, Cl. 254-10.00B.
Sack, David A.; and Stephensen, Charles B. Non-invasive test for gastric acid. 4,548,805, Cl. 424-9.000.
Saculla, Frank W. Combined cigarette extinguisher and ash tray. 4,548,217, Cl. 131-235.100.
Saida, Keiichi: *See—*
Shiga, Tokio; and Saida, Keiichi, 4,548,536, Cl. 414-225.000.
Saikei Giken Kogyo Kabushiki Kaisha: *See—*
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Sailor Pen Co., Ltd., The: *See—*
Osaki, Kazuhiko; Hamamoto, Hirofumi; Kurokawa, Junzi; and Akieda, Shigeru, 4,547,946, Cl. 29-412.000.
Oshita, Katuzi, 4,547,947, Cl. 29-412.000.
St. John, Frank; and Martin, Wayne, to Rohm and Haas Company. Solderable polymer thick films. 4,548,879, Cl. 427-96.000.
Saito, Koji: *See—*
Enjoji, Susumu; and Saito, Koji, 4,548,210, Cl. 128-660.000.
Saito, Syozo: *See—*
Inoue, Masao; Suzuki, Shingo; and Saito, Syozo, 4,548,469, Cl. 350-128.000.
Saito, Toshio; Matsumoto, Kenzo; and Soji, Kazuo, to Matsushita Electric Industrial Co., Ltd. Cycle timer. 4,549,260, Cl. 364-143.000.
Saito, Toshio: *See—*
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Sakaeda, Keiko: *See—*
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Sakai, Katsuhide; and Matsui, Noboru, to Carl Freudenberg, Firma. Adhesive interlining. 4,548,860, Cl. 428-290.000.
Sakai, Shinzou: *See—*
Nishikawa, Masao; and Sakai, Shinzou, 4,548,307, Cl. 192-0.076.
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, to Agency of Industrial Science & Technology. Metal hydride container and metal hydride heat storage system. 4,548,044, Cl. 62-48.000.
Sakakibara, Shigemi: *See—*
Nomura, Yoshihisa; Katagiri, Masayoshi; and Sakakibara, Shigemi, 4,548,093, Cl. 74-512.000.
Sakakibara, Shinsuke: *See—*
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Sakakibara, Shiro: *See—*
Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,548,099, Cl. 74-689.000.
Sakakibara, Tatsuo: *See—*
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,548,126, Cl. 92-213.000.
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Rotary compressor housing. 4,548,558, Cl. 418-83.000.
Sakamoto, Hitoshi, to Sony Corporation. Method and apparatus for tracking control. 4,549,234, Cl. 360-10.200.
Sakamoto, Hitoshi, to Sony Corporation. Apparatus for reproducing video signals. 4,549,235, Cl. 360-10.200.
Sakano, Kozaburo: *See—*
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,548,985, Cl. 525-65.000.
Sakaoka, Hiromu: *See—*
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Sakashita, Takeshi; and Nakano, Takayuki, to Mitsui Petrochemical Industries, Ltd. Photocurable resin composition. 4,548,689, Cl. 204-159.230.
Sakata, Hiromi: *See—*
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Sakharnov, Vasily A.: *See—*
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.
Salama, Clement A.: *See—*
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Salazar, Ramon: *See—*
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Salem, Eli: *See—*
Kunin, Robert; and Salem, Eli, 4,548,717, Cl. 210-670.000.
Salmon, John K.; and Yoo, Young S., to Otis Elevator Company. Elevator car vibration control with friction damper. 4,548,297, Cl. 187-20.000.
San Mar Laboratories, Inc.: *See—*
Bernat, Fred, 4,548,841, Cl. 427-372.200.
Sanden Corporation: *See—*
Hiraga, Masaharu; and Yoshii, Yuji, 4,548,555, Cl. 418-55.000.
Terauchi, Kiyoshi, 4,548,556, Cl. 418-55.000.
Sander, Engelbert, to Automation Industrielle, S.A. Packing tube. 4,548,338, Cl. 222-107.000.
Sandoz Ltd.: *See—*
Deur, Michel; and Toth, Istvan, 4,549,026, Cl. 548-257.000.
Hasler, Rolf; and Palacin, Francis, 4,548,902, Cl. 436-2.000.
Schone, Alfred, 4,548,609, Cl. 8-94.210.
Sankyo Company Limited: *See—*
Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, 4,548,926, Cl. 514-19.000.
Santen, Sven: *See—*
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Sanyo Denki Co., Ltd.: *See—*
Niimura, Yoshihisa; and Shimamura, Shin, 4,549,104, Cl. 310-67.00R.
Sapi, Janos: *See—*
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Sz,orny, Laszlo , 4,549,020, Cl. 546-51.000.
Sasaki, Atsushi: *See—*
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.
Sasaki, Noboru, to France Bed Co., Ltd. Spring unit. 4,548,390, Cl. 267-91.000.
Sashida, Toshiiku. Supersonic vibration driven motor device. 4,548,090, Cl. 74-88.000.
Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus with volume and density sensing. 4,548,286, Cl. 177-1.000.
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Sato, Kazuhiro. Toss batting trainer. 4,548,407, Cl. 273-26.00R.
Sato, Kunihiko; and Takahashi, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling the air-fuel ratio in an internal-combustion engine. 4,548,178, Cl. 123-478.000.
Sato, Masato: *See—*
Tamba, Shinichi; Sato, Masato; Watanabe, Kozo; and Yamashita, Masanobu, 4,548,167, Cl. 123-41.560.
Sato, Yasuo: *See—*
Nomaki, Koji; Mase, Hiroshi; Sato, Yasuo; and Iga, Motoichi, 4,548,636, Cl. 65-99.200.
Satoh, Kozo: *See—*
Suzuki, Hirokazu; and Satoh, Kozo, 4,549,137, Cl. 324-309.000.
Satoh, Susumu; Mogi, Kinichi; Murakami, Saburo; and Nakashima, Toshiaki, to SS Pharmaceutical Co., Ltd. 2,3-Butanediol diester derivatives. 4,548,753, Cl. 260-410.000.
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, to Fuji Jukogyo Kabushiki Kaisha. Slip indicating system for a four-wheel drive vehicle. 4,549,163, Cl. 340-52.00R.
Satoh, Yukio: *See—*
Masuda, Shunichi; and Satoh, Yukio, 4,549,314, Cl. 455-618.000.
Sauer, Craig A. Tool for notching and slitting tubing. 4,548,114, Cl. 83-391.000.
Sauer, Harald; Schmidt, Hans-Werner; and Fennemann, Wolfgang, to Metallgesellschaft Aktiengesellschaft. Process of removing pollutants from exhaust gases. 4,548,797, Cl. 423-240.000.
Savoye, Eugene D.; and Tomasetti, Charles M., to RCA Corporation. Imaging device having improved high temperature performance. 4,547,957, Cl. 29-572.000.
Sawata, Tetsuya: *See—*
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, 4,548,109, Cl. 83-71.000.

Schafer, Gregory L.: *See*—
Schafer, Tony L.; Schafer, Stephen A.; Schafer, Gregory L.; and Swett, H. Darwin, 4,548,194, Cl. 126-110.00R.

Schafer, Stephen A.: *See*—
Schafer, Tony L.; Schafer, Stephen A.; Schafer, Gregory L.; and Swett, H. Darwin, 4,548,194, Cl. 126-110.00R.

Schafer, Tony L.; Schafer, Stephen A.; Schafer, Gregory L.; and Swett, H. Darwin. Fuel stoker and furnace. 4,548,194, Cl. 126-110.00R.

Scharf, Rolf: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,548,729, Cl. 252-174.210.

Scharpey, Wilhelm, to Swiss Aluminum Ltd. Reduction pot. 4,548,692, Cl. 204-243.00R.

Scheinpflug, Hans: *See*—
Holmwood, Graham; Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Scheinpflug, Hans, 4,548,945, Cl. 514-383.000.

Schelling, Armin: *See*—
Schelling, Mario; Schelling, Bruno; and Schelling, Armin, 4,548,123, Cl. 91-39.000.

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Schemel, Roberto: *See*—
Rodriguez, Domingo; Schemel, Roberto; and Salazar, Ramon, 4,548,792, Cl. 423-65.000.

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Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Scherer, Michael: *See*—
Dietrich, Anton; Hartig, Klaus; Lenz, Werner; and Scherer, Michael, 4,548,691, Cl. 204-192.00P.

Schering AG: *See*—
Stein, Theodor, 4,548,715, Cl. 210-614.000.

Scheuerman, Ronald F.; and Silverman, Seth A., to Shell Oil Company. Process for acidizing hot siliceous material. 4,548,732, Cl. 252-8.55C.

Schicketanz, Dieter: *See*—
Geckeler, Siegfried; and Schicketanz, Dieter, 4,548,494, Cl. 356-73.100.

Schiffer, Harald: *See*—
Brendle, Konrad; Schiffer, Harald; and Fahrenschon, Kurt, 4,548,475, Cl. 350-334.000.

Schlapp, Werner; and Mulch, Herbert, to Ernst Leitz Wetzlar GmbH. Adjusting device for lenses. 4,548,471, Cl. 350-255.000.

Schlich, William R.: *See*—
Mellinger, Gary A.; Giles, Harold F., Jr.; Holub, Fred; and Schlich, William R., 4,548,997, Cl. 525-433.000.

Schlick, Erich: *See*—
Heider, Alfred; Schlick, Erich; and Schnall, Gunther, 4,548,399, Cl. 271-221.000.

Schlussler, Hans-Joachim: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,548,729, Cl. 252-174.210.

Schmid, Carl E., to Perkin-Elmer Corporation, The. Pulse damper. 4,548,713, Cl. 210-198.200.

Schmid, Christian: *See*—
Widmer, Hans R.; and Schmid, Christian, 4,549,000, Cl. 525-482.000.

Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, to Henkel KGaA. Aqueous foam-inhibiting compositions containing alkyl polyethylene glycol alkyl ethers. 4,548,729, Cl. 252-174.210.

Schmid, Wolfgang: *See*—
Linde, Gerhard; Schmid, Wolfgang; Boelt, Manfred; and Burr, Peter S., 4,548,618, Cl. 55-16.000.

Schmidlkofer, Jakob: *See*—
von Au, Gunter; Innertsberger, Ernst; Schmidlkofer, Jakob; and Kaiser, Wolfgang, 4,549,004, Cl. 528-42.000.

Schmidt, Hans-Friedrich: *See*—
von Tomkewitsch, Sybille; and Schmidt, Hans-Friedrich, 4,548,740, Cl. 252-511.000.

Schmidt, Hans-Werner: *See*—
Sauer, Harald; Schmidt, Hans-Werner; and Fennemann, Wolfgang, 4,548,797, Cl. 423-240.000.

Schmidt, Richard J.: *See*—
Ali Khan, Mir I.; and Schmidt, Richard J., 4,548,856, Cl. 428-171.000.

Schmidt, Ted F. Sprinkler device for a lawn chair. 4,548,357, Cl. 239-289.000.

Schmidt, Thomas R., to Miles Laboratories, Inc. Acid soluble annatto colorant in a powdered form. 4,548,822, Cl. 426-96.000.

Schnall, Gunther: *See*—
Heider, Alfred; Schlick, Erich; and Schnall, Gunther, 4,548,399, Cl. 271-221.000.

Schneider, Jack H.; and Huber, Gary D., to Ford Motor Company. Vehicle speed control. 4,549,266, Cl. 364-426.000.

Schneider, Werner; Pangritz, Dirk; and Riedesser, Walter, to B.A.T. Cigaretten-Fabriken GmbH. Cigarette paper. 4,548,677, Cl. 162-139.000.

Schomburg, John R., to Sperry Corporation. Apparatus for creating a multiplication pipeline of arbitrary size. 4,549,280, Cl. 364-738.000.

Schone, Alfred, to Sandoz Ltd. Method for marking defects in leather. 4,548,609, Cl. 8-94.210.

Schrader, Manfred: *See*—
Ertingshausen, Friedrich; Heinrich, Volker; Hinkel, Holger; Kaus, Gerhard; Kempf, Jurgen; Nauth, Hans-Georg; and Schrader, Manfred, 4,549,238, Cl. 360-103.000.

Schreiber, William L.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,548,743, Cl. 252-522.00R.

Schroeder, Jeffrey L., to Product Identification Corporation. Marking machine control system. 4,548,519, Cl. 400-61.000.

Schroll, Craig R.: *See*—
Katz, Murray; and Schroll, Craig R., 4,548,874, Cl. 429-18.000.

Schuerer, Paul H.; Ehl, James H.; and Prasthofer, Willibald P., to United States of America, National Aeronautics and Space Administration. Cryogenic insulation strength and bond tester. 4,548,083, Cl. 73-827.000.

Schuler, Bernhard; Schuller, Ferdinand; and Wohlgemuth, Werner, to Theodor Groz & Sohne & Ernst Beckert. Stamped knitting tool for knitting machines. 4,548,056, Cl. 66-121.000.

Schuller, Ferdinand: *See*—
Schuler, Bernhard; Schuller, Ferdinand; and Wohlgemuth, Werner, 4,548,056, Cl. 66-121.000.

Schultz, Friedrich: *See*—
Brandt, Eckhard; and Schultz, Friedrich, 4,548,404, Cl. 271-303.000.

Schwab, Alfred: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,548,928, Cl. 514-232.000.

Schwartz, Jack; and Wu, Tai T. Method for correcting acoustic distortion. 4,549,289, Cl. 369-53.000.

Schwarz, Ernest D., II: *See*—
King, Donald L.; Ruff, Robert O.; and Schwarz, Ernest D., II, 4,547,930, Cl. 16-382.000.

Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles. 4,548,956, Cl. 521-56.000.

Schwarzer, Hans; and Meisel, Werner, to Peroxid-Chemie GmbH. Process for removing hydrogen sulfide from natural gas, oil and mixtures thereof. 4,548,708, Cl. 208-196.000.

Schwede, Franz-Josef. Pilot-operated pressure-limiting valve with a feeding function. 4,548,231, Cl. 137-491.000.

Schwerdtel, Wulf; Lauer, Hubert; and Heinrich, Josef, to Bayer Aktiengesellschaft. Catalyst, a process for its preparation and an isomerization process in the presence of this catalyst. 4,548,913, Cl. 502-68.000.

Sclavo, Inc.: *See*—
Kameda, Naomi, 4,548,908, Cl. 436-500.000.

Scordialo, Angelo, to Rohm GmbH. Method for dehydrating sludge. 4,548,719, Cl. 210-732.000.

Scott, Eric J. Y.: *See*—
Bowes, Emmerson; Farcasiu, Malvina; and Scott, Eric J. Y., 4,548,709, Cl. 208-213.000.

Scott, Keith T.: *See*—
Woodhead, James L.; Scott, Keith T.; and Wilcockson, Alan, 4,548,832, Cl. 427-34.000.

Scott, William J.: *See*—
Masheris, Fred; Michaels, Leonard H.; Scott, William J.; and Voss, Roy N., 4,549,038, Cl. 174-65.0SS.

SDS Biotech Corporation: *See*—
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.

Seager, Richard H., to Calumet Manufacturing Co. Dispensing package with applicator surface. 4,548,524, Cl. 401-187.000.

Searcy, Albert P. Fishing line system. 4,547,991, Cl. 43-18.100.

Sears Manufacturing Company: *See*—
Hulsebusch, William H.; and Hinkhouse, Lysle R., 4,547,920, Cl. 5-468.000.

Sears, Roebuck & Co.: *See*—
Meharg, Richard D.; and Singletary, Buckley A., 4,548,250, Cl. 160-331.000.

Seely, James R.; and Ursprung, Cecil E., to Marketing Displays, Inc. Compact sign and stand. 4,548,379, Cl. 248-624.000.

Segawa, Makoto; and Ariizumi, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Driver circuit having a bootstrap buffer circuit. 4,549,102, Cl. 307-578.000.

Seidman, Abraham. Puzzle toy. 4,548,411, Cl. 273-153.00R.

Seitelman, Leon H.; and Kaveckas, Edward J., to United Technologies Corporation. Method for chamfering the edges of gear teeth. 4,548,531, Cl. 409-9.000.

Seitz, William R.; and Zhujun, Zhang, to Allied Corporation. Fluorescent fluid determination method and apparatus. 4,548,907, Cl. 436-163.000.

Seki, Kisuke: *See*—
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, 4,548,617, Cl. 51-293.000.

Seki, Teruo: *See*—
Yamauchi, Takahiko; Seki, Teruo; and Aoyama, Keizo, 4,549,199, Cl. 357-68.000.

Seki, Tokahiro: *See*—
Okahata, Yoshio; and Seki, Tokahiro, 4,548,955, Cl. 521-53.000.

Sekikawa, Nobuyoshi; Katsuyama, Harumi; and Kondo, Asaji, to Fuji Shashin Film Kabushiki Kaisha. Integral multilayer analytical element for the analysis of ammonia or an ammonia forming substrate and a method for the detection thereof using the same. 4,548,906, Cl. 436-113.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, 4,548,186, Cl. 123-556.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Hayashi, Motoshige; and Kobayashi, Toshiro, 4,548,775, Cl. 264-45.500.

Selenia SpA: *See*—
Farina, Alfonso, 4,549,183, Cl. 343-7.00A.

Sells, Richard L.; and Taylor, Mark L. Measurement of surface area for electrodeposition plating processes. 4,548,285, Cl. 177-1.000.

Sellschopp, Michael, to Leybold-Heraeus GmbH. Equipment for producing coatings having a rotationally symmetric thickness profile by cathodic evaporation. 4,548,698, Cl. 204-298.000.

Sellstrom, Kathy B.: *See*—
McEntire, Edward E.; Knifton, John F.; Nieh, Edward C. Y.; and Sellstrom, Kathy B., 4,549,017, Cl. 544-168.000.

Senapati, Nagabhusan; and Mangaraj, Duryodhan, to Battelle Memorial Institute. Ultrasonic vulcanization. 4,548,771, Cl. 264-23.000.

Sendelweck, Gene K., to RCA Corporation. Automatic contrast reduction circuit for a teletext or monitor operation. 4,549,217, Cl. 358-243.000.

Sendelweck, Gene K.: *See*—
Norley, Ronald R.; Sendelweck, Gene K.; and Chen, Keming J., 4,549,218, Cl. 358-243.000.

Senders, John W.: *See*—
Ginpil, Frederick D.; Milner, Morris; and Senders, John W., 4,547,918, Cl. 5-446.000.

Senso, Hitoshi: *See*—
Banno, Tsutomu; Hayashi, Michiaki; and Senso, Hitoshi, 4,549,120, Cl. 318-254.000.

Sensormatic Electronics Corporation: *See*—
Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., 4,549,186, Cl. 343-748.000.

Sepulveda, Domingo; and Striebel, Edmund E., to United Technologies Corporation. Method of distributing fuel flow to an annular burner for starting of a gas turbine engine. 4,548,032, Cl. 60-39.060.

Serafin, Orest M.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Sericol Group Limited: *See*—
Dickinson, Peter; and Ellwood, Michael, 4,548,890, Cl. 430-280.000.

Sermatech International Incorporated: *See*—
Mosser, Mark F.; and Fabiny, William J., 4,548,646, Cl. 106-14.120.

Serres, Bernard M.; and Doucet, Joel R. System for managing a panel of objects such as keys. 4,549,170, Cl. 340-568.000.

Severwright, Jeremy S., to EMI Limited. Tactile array sensor. 4,549,093, Cl. 307-147.000.

Sezaki, Masaji: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.

SGS-Ates Componenti Elettronici S.p.A.: *See*—
Stefani, Fabrizio; Cini, Carlo; and Diazzi, Claudio, 4,549,095, Cl. 307-254.000.

Shackleton, Craig, to Mead Corporation, The. Orifice plate for ink jet printer. 4,549,188, Cl. 346-1.100.

Shaer, Elias H., to Drackett Company, The. Aqueous compositions containing stabilized enzymes. 4,548,727, Cl. 252-171.000.

Shaheen, Joseph M.: *See*—
Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., 4,548,661, Cl. 156-52.000.

Shallcross, Frank V. L.: *See*—
Kosonocky, Walter F.; and Shallcross, Frank V. L., 4,548,671, Cl. 156-643.000.

Shanley, Robert L., II, to RCA Corporation. DC Stabilization system. 4,549,203, Cl. 358-34.000.

Sharma, Ashok K. Fluorinated cellulose acetate polymers. 4,549,012, Cl. 536-82.000.

Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; Takamatsu, Toshiaki; Yasuda, Shuuhei; and Matsuura, Masataka, 4,549,174, Cl. 340-784.000.

Shaw, R. Howard: *See*—
Hutchinson, Martin A.; Shaw, R. Howard; and Coad, George, 4,548,699, Cl. 204-298.000.

Shearer, Marcia C.: *See*—
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,548,974, Cl. 424-118.000.

Shechter, Leon: *See*—
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,548,764, Cl. 261-75.000.

Sheehan, Ronald T.; and Hyman, Myles, to Sperry Corporation. Fore-and-aft leveling mechanism for combine cleaning apparatus. 4,548,214, Cl. 130-27.0AE.

Sheffield, Miller; Metcalfe, Robert S.; and Calvin, James W., to Standard Oil Company. Method of displacing fluids within a gas-condensate reservoir. 4,548,267, Cl. 166-268.000.

Sheill, David D.; Davidson, Donald J.; and Dettloff, David J., to Rockwell International Corporation. Disc brake friction pad and stabilizing support. 4,548,300, Cl. 188-73.100.

Shell Oil Company: *See*—
Goodall, Brian L.; and Job, Robert C., 4,548,915, Cl. 502-104.000.
Kalubowila, Prematilaka W.; Wach, Stanislaw P.; and Levens, Michael B., 4,549,043, Cl. 174-133.00R.
Scheuerman, Ronald F.; and Silverman, Seth A., 4,548,732, Cl. 252-8.55C.
Thompson, Mark S.; and Adams, Charles T., 4,548,920, Cl. 502-219.000.
van der Burgt, Maarten J., 4,548,529, Cl. 406-53.000.

Shelley Manufacturing Company, Division of Alco Food Service Equipment Company: *See*—
Abrams, Stanton, 4,548,221, Cl. 134-141.000.

Shemitz, Sylvan R., to Sylvan R. Shemitz and Associates, Inc. Overhead lighting system for one or more visual display terminals. 4,549,249, Cl. 362-33.000.

Sherman, Charles F., to Nielsen Moulding Design Corp. Framing system. 4,547,986, Cl. 40-155.000.

Sherritt Gordon Mines Limited: *See*—
Silins, Vilnis; and Tameling, Jerome H., 4,547,985, Cl. 37-118.00R.

Sherva-Parker, Carole J. Amputation apparatus. 4,547,912, Cl. 623-16.000.

Shibaoka, Kazuo; Onishi, Shunji; Miwa, Takao; and Akimoto, Toshio, to Nippon Sheet Glass Co., Ltd. Mold and method for producing molded glass articles. 4,548,634, Cl. 65-79.000.

Shibata, Fumio; and Kawasaki, Shunzo, to Teijin Limited. High density, water-repellent textile fabric. 4,548,848, Cl. 428-85.000.

Shibata, Yoshikazu, to Japan Life Co., Ltd. Lid knob of pressure cooker. 4,548,156, Cl. 116-70.000.

Shideler, Anthony; and Raddatz, Dwight B., to Ball Corporation. Sheet metal evaluator. 4,549,306, Cl. 378-58.000.

Shidner, Morris I. Equidae coronet boot. 4,548,026, Cl. 54-82.000.

Shiflet, Roger T.: *See*—
Martinovich, Robert J.; Mathis, Ronald D.; and Shiflet, Roger T., 4,548,971, Cl. 524-101.000.

Shiga, Tokio; and Saida, Keiichi, to Toyoda Koki Kabushiki Kaisha; and Kabushiki Kaisha Chubu Netsuren Kenkyusho. Working apparatus with track following motion. 4,548,536, Cl. 414-225.000.

Shiga, Tsutomu, to Nippondenso Co. Ltd. Multi-path cooling in an AC generator for a vehicle. 4,549,103, Cl. 310-60.00R.

Shigeta, Sadaaki: *See*—
Nemoto, Yuhei; Shigeta, Sadaaki; and Yokokawa, Yoshio, 4,548,889, Cl. 430-273.000.

Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, to Shin-Kobe Electric Machinery Co., Ltd. Storage battery plate-grid and retainer construction. 4,548,882, Cl. 429-211.000.

Shimada, Junichi: *See*—
Mitsuhashi, Yoshinobu; and Shimada, Junichi, 4,549,300, Cl. 372-50.000.

Shimadzu Corporation: *See*—
Komoto, Akira, 4,548,288, Cl. 177-180.000.

Shimamoto, Mamoru: *See*—
Yamada, Takashi; and Shimamoto, Mamoru, 4,549,099, Cl. 307-359.000.

Shimamura, Shin: *See*—
Niimura, Yoshihisa; and Shimamura, Shin, 4,549,104, Cl. 310-67.00R.

Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,548,370, Cl. 242-211.000.

Shimeki, Yasuharu: *See*—
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; and Takeuchi, Kousou, 4,549,167, Cl. 340-347.0DD.

Shimizu, Keisuke: *See*—
Kobayashi, Koji; and Shimizu, Keisuke, 4,548,333, Cl. 220-276.000.

Shimizu, Kenshi: *See*—
Ishida, Takashi; Shimizu, Kenshi; and Kamiyama, Shuichi, 4,548,176, Cl. 123-342.000.

Shimizu, Seizaburo: *See*—
Kaneko, Nagao; Fujimori, Yoshinori; Shimizu, Seizaburo; and Obara, Shin, 4,549,107, Cl. 310-327.000.

Shimizu, Shigehisa: *See*—
Kanaoka, Takeshi; Nakamura, Katutoshi; and Shimizu, Shigehisa, 4,548,492, Cl. 355-50.000.

Shimizui, Tunehiko: *See*—
Ayabe, Mitsukuni; Shimizui, Tunehiko; Kibayashi, Iwao; and Hirano, Hideki, 4,549,028, Cl. 548-308.000.

Shimohiro, Yoshiyuki; Ogawa, Masazo; and Ohnishi, Tooru, to Dainippon Pharmaceutical Co., Ltd. Thickening agent for paste. 4,548,648, Cl. 106-208.000.

Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, to Sumitomo Chemical Company, Limited. Process for producing semipermeable membrane. 4,548,769, Cl. 264-22.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,548,867, Cl. 428-409.000.

Shin-Kobe Electric Machinery Co., Ltd.: *See*—
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,548,882, Cl. 429-211.000.

Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, to Fujikura Ltd. Flame-retardant cross-linked composition and flame-retardant cable using same. 4,549,041, Cl. 174-113.00R.

Shinn, Calvin W.; and Terry, Robert G., to Dresser Industries, Inc. Roller ball retention of reamer cutter assembly. 4,548,284, Cl. 175-346.000.

Shinogaya, Toshikazu: *See—*
Kitamura, Takashi; Fukuura, Yukio; Tanuma, Itsuo; Shinogaya, Toshikazu; and Noda, Yuji, 4,548,687, Cl. 204-159.170.

Shinozaki, Fumiaki: *See—*
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Kawamura, Kouichi, 4,548,892, Cl. 430-288.000.

Shinozaki, Kaoru: *See—*
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,548,899, Cl. 430-558.000.

Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, to Murata Kikai Kabushiki Kaisha. Automatic tool exchanging system. 4,547,955, Cl. 29-568.000.

Shippey, Michael A., to Chevron Research Company. Ortho-carboxy phenylphenone lubricating oil additives. 4,548,723, Cl. 252-39.000.

Shiraishi, Hisashi: *See—*
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,869, Cl. 428-474.700.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,548,870, Cl. 428-474.700.

Shirasaki, Masataka, to Fujitsu Limited. Optical device. 4,548,478, Cl. 350-377.000.

Shiratsuki, Yoshiyuki, to Fuji Xerox Co., Ltd. Thermal printing head. 4,549,189, Cl. 346-76.0PH.

Shirley, Ian M.: *See—*
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,548,737, Cl. 252-500.000.

Shiseido Company Ltd.: *See—*
Kubo, Sanae; and Nakamura, Fumiaki, 4,548,811, Cl. 424-71.000.

Shomura, Takashi: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.

Shop-Vac Corporation: *See—*
Berfield, Robert C., 4,547,927, Cl. 15-327.00F.

Shopsmith, Inc.: *See—*
Legler, John G.; Bartlett, Robert L.; Haas, Charles J.; Woods, Garry W.; and Clark, John O., 4,548,246, Cl. 144-1.00C.

Shores, David A.: *See—*
Iacovangelo, Charles D.; and Shores, David A., 4,548,877, Cl. 429-41.000.

Shortt, Alexandra B.; and Haag, William G., to Stauffer Chemical Company. Bis-alkylene trithiophosphonate insecticides. 4,548,930, Cl. 514-103.000.

Shroot, Braham; and Maignan, Jean, to Societe Anonyme dite: L'Oreal; and Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D. Anti-acne use of derivatives of (5,4b)-isothiazolo pyridine-3-one. 4,548,942, Cl. 514-301.000.

Sidwell, William S.: *See—*
Cullen, Robert E.; Kurowski, Henry B.; and Sidwell, William S., 4,547,938, Cl. 28-254.000.

Siedhoff, George H. High efficiency fluid heater. 4,548,163, Cl. 122-13.00R.

Siedle, Allen R., to Minnesota Mining and Manufacturing Company. Rhodium-and iridium-nitrogen complex catalysts. 4,549,018, Cl. 544-225.000.

Siemens Aktiengesellschaft: *See—*
Auracher, Franz; and Stockmann, Michael, 4,548,464, Cl. 350-96.140.
Geckeler, Siegfried; and Schicketanz, Dieter, 4,548,494, Cl. 356-73.100.
Hoffmann, Kurt, 4,549,096, Cl. 307-297.000.
Metzner, Uwe, 4,549,133, Cl. 324-60.00R.
Steinmann, Peter; Engel, Reinhard; Parstorfer, Richard; Brugger, Rudolf; and Jonke, Gerhard, 4,548,669, Cl. 156-358.000.
Stoerk, Peter; and Thom, Gunter, 4,548,467, Cl. 350-96.210.
von Tomkewitsch, Sybille; and Schmidt, Hans-Friedrich, 4,548,740, Cl. 252-511.000.

Siemens Gammasonics, Inc.: *See—*
Groch, Mark W.; and Domnanovich, James R., 4,548,204, Cl. 128-700.000.

Sieradzki, Ryszard. Remote station monitoring system. 4,549,168, Cl. 340-525.000.

Sigmund, Gunther: *See—*
Stolz, Albert; Volz, Wolfgang; and Sigmund, Gunther, 4,548,355, Cl. 236-37.000.

Silins, Vilnis; and Tameling, Jerome H., to Sherritt Gordon Mines Limited. Method of protecting a metallic surface susceptible to abrasion by rock-like material. 4,547,985, Cl. 37-118.00R.

Silveri, Luigi: *See—*
Nanda, Ashok K.; Silveri, Luigi; and McCool, Michael A., 4,548,673, Cl. 162-4.000.

Silverman, Harold: *See—*
Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, 4,548,400, Cl. 271-226.000.

Silverman, Seth A.: *See—*
Scheuerman, Ronald F.; and Silverman, Seth A., 4,548,732, Cl. 252-8.55C.

Simo, Miroslav A. Laterally adjustable arrow rest for an archery bow. 4,548,188, Cl. 124-41.00A.

Simojyo, Tetuzi: *See—*
Harada, Mineo; Simojyo, Tetuzi; and Furuya, Kaname, 4,548,522, Cl. 400-124.000.

Simon, Donald J., to Maytag Company, The. Cooling system for an induction cooking cartridge. 4,549,052, Cl. 219-10.49R.

Simpson, Howard D., to Union Oil Company of California. Hydrocarbon processing. 4,548,710, Cl. 208-216.0PP.

Simpson, Timothy J. Automatically opening decorative fire extinguisher cover. 4,548,274, Cl. 169-51.000.

Singletary, Buckley A.: *See—*
Meharg, Richard D.; and Singletary, Buckley A., 4,548,250, Cl. 160-331.000.

Sitrin, Robert D.: *See—*
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,548,974, Cl. 424-118.000.

Sizelove, Cary L.: *See—*
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,548,277, Cl. 172-265.000.

SKF Steel Engineering AB: *See—*
Eriksson, Sune; Johansson, Borje; and Santen, Sven, 4,548,621, Cl. 55-72.000.

Skiles, Jerry W.: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,548,928, Cl. 514-232.000.

SKW Trostberg Aktiengesellschaft: *See—*
Stahl, Egon; and Quirin, Karl-Werner, 4,548,755, Cl. 260-412.800.
Weber, Peter, 4,548,796, Cl. 423-175.000.

Slagle, Richard M., to Joy Manufacturing Company. Control system and method for operating mining machine traction motors and the like. 4,549,119, Cl. 318-11.000.

Slattery, Gordon C., to Brunswick Corp. Outboard motor shift shaft connecting pin lock. 4,548,587, Cl. 440-86.000.

Slattery, Ian: *See—*
Price, Herbert B.; and Slattery, Ian, 4,548,140, Cl. 112-79.00R.

Slaughterbeck, Perry K. Protective sleeve for sphygmomanometer cuff. 4,548,249, Cl. 150-52.00R.

Sliger, Boyd P.: *See—*
Wagner, Joseph P.; and Sliger, Boyd P., 4,548,354, Cl. 236-345.000.

Smith, Dennis C.; and Maijer, Rolf, to Dennis Smith Consulting Ltd.; and Romada Holdings Ltd. Bonding to calcified tissues. 4,548,583, Cl. 433-228.100.

Smith International, Inc.: *See—*
Leicht, Frederick M.; Baugh, Benton F.; and Palany, Harish C., 4,548,273, Cl. 166-348.000.

Smith, Irl W.; and Dorschner, Terry A., to Raytheon Company. Laser gyroscope system. 4,548,501, Cl. 356-350.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Floor cleaning composition. 4,548,954, Cl. 521-52.000.

Smith Kline & French Laboratories Limited: *See—*
Ife, Robert J., 4,548,940, Cl. 514-272.000.

Smith, Lawther O.; Howard, Timothy L.; and Kautz, Franz A., to Fichtel & Sachs Industries, Inc. Redundant high-pressure seal for fluid spring. 4,548,389, Cl. 267-64.110.

Smith, Roger R., to United States of America, Army. Road wheel mounting assembly. 4,548,290, Cl. 180-9.100.

Smith, Stephen A.: *See—*
Ward, Robert W.; Smith, Stephen A.; and Markwell, Roger E., 4,548,948, Cl. 514-422.000.

Smith, Terence J.: *See—*
Irving, Edward; and Smith, Terence J., 4,548,895, Cl. 430-325.000.

Smith, Thomas W.: *See—*
Badesha, Santokh S.; and Smith, Thomas W., 4,548,800, Cl. 423-510.000.

Smith Valve Corporation: *See—*
Harding, Bruce L., 4,548,384, Cl. 251-163.000.

Smith, Walter W.: *See—*
States, Kenneth H.; and Smith, Walter W., 4,548,840, Cl. 427-365.000.

SmithKline Beckman Corporation: *See—*
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,548,974, Cl. 424-118.000

Smits, Cornelis A.: *See—*
Kimmelaar, Rudolf J. A.; and Smits, Cornelis A., 4,547,997, Cl. 51-168.000.

Smrek, Walter J.: *See—*
Boles, Sol; and Smrek, Walter J., 4,549,184, Cl. 343-11.00R.

SMS Schloemann-Siemag AG: *See—*
Bohnenkamp, Heinrich, 4,548,064, Cl. 72-236.000.

Snellman, Donald L.; Pearson, Bernard A.; and Jacobs, John W., to Snellman, Donald L. Microfiche feeder. 4,548,395, Cl. 271-11.000.

Snellman, Donald L.; and Pearson, Bernard A., to Snellman, Donald L. Collator. 4,548,398, Cl. 271-197.000.

Snow Brand Milk Products Co., Ltd.: *See—*
Kobayashi, Koji; and Shimizu, Keisuke, 4,548,333, Cl. 220-276.000.

Snyder General Corporation: *See—*
Hoeffken, Russell W., 4,547,943, Cl. 29-157.30R.

Societe Anonyme de Telecommunications: *See—*
Missout, Bernard M., 4,548,567, Cl. 425-113.000.

Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM): *See—*
Besson, Bernard; and Guernet, Jacques, 4,548,098, Cl. 74-687.000.

Societe Anonyme dite: *See—*
Llorente, Jacques L., 4,548,319, Cl. 206-314.000.

Societe Anonyme dite: L'Oreal: *See—*
Shroot, Braham; and Maignan, Jean, 4,548,942, Cl. 514-301.000.

Societe Chimique des Charbonnages-CdF CHIMIE: *See—*
Avenel, Michel; Evrard, Paul; and Leca, Jean-Paul. 4,549,033, Cl. 136-251.000.

Societe d'Etudes, Recherches et Constructions: *See*—
Fleurance, Claude; and Naudot, Jean-Claude, 4,549,285, Cl. 367-60.000.

Societe Francaise des Produits pour Catalyse Pro-Catalyse: *See*—
Bournonville, Jean-Paul; and Dinh, Chan T., 4,548,918, Cl. 502-154.000.

Societe Francaise d'Orthopodie: *See*—
Aigrefeuille, Charles V. Y., 4,548,563, Cl. 425-2.000.

Societe Industrielle de Liaisons Electriques: *See*—
Missout, Bernard M., 4,548,567, Cl. 425-113.000.

Societe Miniere et Metallurgique de Penarroya: *See*—
Beutier, Didier; Bruvier, Hugues; and Palvadeau, Claude, 4,548,793, Cl. 423-92.000.

Soda, Takashi: *See*—
Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, 4,548,777, Cl. 264-107.000.

Sogo Pharmaceutical Company Limited: *See*—
Okahata, Yoshio; and Seki, Tokahiro, 4,548,955, Cl. 521-53.000.

Soji, Kazuo: *See*—
Saito, Toshio; Matsumoto, Kenzo; and Soji, Kazuo, 4,549,260, Cl. 364-143.000.

Solarex Corporation: *See*—
Mabie, Curtis P., Jr.; Busby, Robert L.; and Cliber, James A., 4,548,381, Cl. 249-114.00R.

Sollich GmbH & Co. KG: *See*—
Sollich, Helmut, 4,548,158, Cl. 118-24.000.

Sollich, Helmut, to Sollich GmbH & Co. KG. Device for applying a flowable fat composition to objects. 4,548,158, Cl. 118-24.000.

Solo Cup Company: *See*—
Clements, Jack D., 4,548,348, Cl. 229-1.50H.

Solodovnikov, Sergei A.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; Serafin, Orest M.; Krivorotenko, Valentin I.; Unigovsky, Mikhail R.; Solodovnikov, Sergei A.; and Rulevsky, Evgeny V., 4,549,060, Cl. 219-59.100.

Somerset Technoiogies, Inc.: *See*—
Pitigliano, Frank J.; and McGill, Paul E., 4,548,569, Cl. 425-133.100.

Somodi, Gyula: *See*—
Dozsa, Laszlo ; Pelencei, Jeno; and Somodi, Gyula, 4,548,460, Cl. 339-107.000.

Sone, Takanori: *See*—
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, 4,549,023, Cl. 546-199.000.

Sonobe, Yougi, to Anritsu Electric Company Limited. Circuit for controlling the rotation angle of a motor. 4,549,125, Cl. 318-663.000.

Sony Corporation: *See*—
Amano, Katutoshi; and Kakuta, Toshio, 4,547,964, Cl. 29-883.000.
Creed, David M.; and Ive, John G. S., 4,549,298, Cl. 371-40.000.
Hashimoto, Yoshitaka; and Eguchi, Takeo, 4,549,227, Cl. 358-328.000.
Nakamura, Masato; and Takemoto, Sohei, 4,549,224, Cl. 358-310.000.
Nakamura, Toshiteru, 4,549,173, Cl. 340-726.000.
Nakano, Kenji; Moriwaki, Hisayoshi; and Takahashi, Takao, 4,549,229, Cl. 360-8.000.
Odaka, Kentaro, 4,549,230, Cl. 360-8.000.
Sakamoto, Hitoshi, 4,549,234, Cl. 360-10.200.
Sakamoto, Hitoshi, 4,549,235, Cl. 360-10.200.
Teranishi, Hiroshi; Nakatsuyama, Takashi; and Inagaki, Masaomi, 4,549,233, Cl. 360-90.000.
Uehara, Seigo; Yamanouchi, Hiroshi; and Kuji, Mitsugu, 4,549,237, Cl. 360-71.000.

Sood, Lal C., to Motorola, Inc. Circuit for generating test equalization pulse. 4,549,101, Cl. 307-443.000.

Soriano, David S.: *See*—
Nalewajek, David; Soriano, David S.; and Borowski, Ralph J., 4,548,763, Cl. 260-989.000.

Soudbrase-Schweisstechnik GmbH: *See*—
Meier, Gudrun, 4,547,941, Cl. 29-156.40R.

Soula, Gerard: *See*—
Lepage, Jean-Luc; and Soula, Gerard, 4,548,917, Cl. 502-150.000.

South, Aubrey, Jr., to Phillips Petroleum Company. Polymer slurry preparation. 4,548,977, Cl. 524-310.000.

Sparer, Randall V.; and Pogany, Stefano A., to Merck & Co., Inc. Bioerodible poly(ortho ester) thermoplastic elastomer from diketene diacetal. 4,549,010, Cl. 528-361.000.

Sparrow, Alan W.: *See*—
Dunn, Stephen J.; and Sparrow, Alan W., 4,548,127, Cl. 92-220.000.

Spector, Donald. Night light assembly. 4,549,250, Cl. 362-96.000.

Spector, George: *See*—
Papadopulos, Demetrio I.; and Spector, George, 4,548,412, Cl. 273-156.000.

Spellar, Peter C.: *See*—
Murphy, David A.; and Spellar, Peter C., 4,548,549, Cl. 417-53.000.

Spence, John R., to Rockwell International Corporation. MOS Voltage comparator and method. 4,549,100, Cl. 307-362.000.

Spencer Wright Industries, Inc.: *See*—
Price, Herbert B.; and Slattery, Ian, 4,548,140, Cl. 112-79.00R.

Speno International S.A.: *See*—
Panetti, Romolo, 4,548,070, Cl. 73-105.000.

Speros, Mark: *See*—
Danna, John M.; and Speros, Mark, 4,548,326, Cl. 211-71.000.

Sperry Corporation: *See*—
Heidel, Jeffrey C.; Hoogervorst, Thomas R.; Lane, Lynn R.; and Swartz, Harold L., 4,547,972, Cl. 33-366.000.
Schomburg, John R., 4,549,280, Cl. 364-738.000.
Sheehan, Ronald T.; and Hyman, Myles, 4,548,214, Cl. 130-27.0AE.
Tarbuck, Robert R., 4,548,111, Cl. 83-196.000.

Spitaler, Engelbert, to TMC Corporation. Safety ski binding release mechaniam. 4,548,424, Cl. 280-612.000.

Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Ketal and use in perfumery. 4,548,743, Cl. 252-522.00R.

Spurrier, Francis R.: *See*—
Lance, Joseph R.; and Spurrier, Francis R., 4,548,875, Cl. 429-26.000.

Squier, William H. R., to A W Squier Limited. Device for separating clods and stone from the soil. 4,548,275, Cl. 171-14.000.

SS Pharmaceutical Co., Ltd.: *See*—
Satoh, Susumu; Mogi, Kinichi; Murakami, Saburo; and Nakashima, Toshiaki, 4,548,753, Cl. 260-410.000.

Stachura, Victor J., to American Precision Industries, Inc. Heat exchanger. 4,548,260, Cl. 165-78.000.

Stahl, Egon; and Quirin, Karl-Werner, to SKW Trostberg Aktiengesellschaft. Process for the extractive production of valuable natural waxes. 4,548,755, Cl. 260-412.800.

Stahlecker, Fritz: *See*—
Lauschke, Dieter; and Feuchter, Wolfgang, 4,548,030, Cl. 57-302.000.

Stahlecker, Hans: *See*—
Lauschke, Dieter; and Feuchter, Wolfgang, 4,548,030, Cl. 57-302.000.

Standard Oil Company: *See*—
Sheffield, Miller; Metcalfe, Robert S.; and Calvin, James W., 4,548,267, Cl. 166-268.000.
York, Earl D.; Johnson, David M.; and Miller, Paul B., 4,548,702, Cl. 208-11.00R.

Standard Oil Company (Indiana): *See*—
Fahlen, Theodore S.; and Mass, Barton, 4,549,091, Cl. 307-106.000.
Papadopoulos, Christos G.; and Calamur, Narasimhan, 4,548,706, Cl. 208-130.000.

Standard Oil Company (Ohio), The: *See*—
Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., 4,548,681, Cl. 204-2.100.

Stanko, Ronald T., to Montefiore Hospital. Method for preventing body fat deposition in mammals. 4,548,937, Cl. 514-251.000.

Stanton, Scott R.: *See*—
Richardson, David L.; Patterson, Peter M.; Clark, Jack P.; Stanton, Scott R.; and Perry, Richard W., 4,548,785, Cl. 376-249.000.

States, Kenneth H.; and Smith, Walter W., to Graham Magnetics Incorporated. High speed coating. 4,548,840, Cl. 427-365.000.

Staudenrausch, Georg; Abt, Franz; Kern, Manfred; and Zimser, Georg, to Albert Handtmann Maschinenfabrik GmbH & Co., KG. Apparatus for automatic delivery from a receiver of adjacently hanging loops of sausages. 4,547,931, Cl. 17-1.00F.

Stauder, Ernst; and Hoffe, Gerhard, to Johs. Girmes & Co. AG. Pile fabric with pile-free positions. 4,548,850, Cl. 428-88.000.

Stauffer Chemical Company: *See*—
Nagubandi, Sreeramulu, 4,548,758, Cl. 260-502.50F.
Nagubandi, Sreeramulu, 4,548,759, Cl. 260-502.50F.
Nagubandi, Sreeramulu, 4,548,760, Cl. 260-502.50F.
Shortt, Alexandra B.; and Haag, William G., 4,548,930, Cl. 514-103.000.
Walker, Francis H.; and Baker, Don R., 4,548,641, Cl. 71-118.000.

Steacy, Paul C., to UOP Inc. Dehydrocyclodimerization process. 4,548,619, Cl. 55-16.000.

Steag AG: *See*—
Kampmann, Harry, 4,548,517, Cl. 374-143.000.

Stefani, Fabrizio; Cini, Carlo; and Diazzi, Claudio, to SGS-Ates Componenti Elettronici S.p.A. Control circuit for switching inductive loads. 4,549,095, Cl. 307-254.000.

Steffen, Jim M.: *See*—
Christiansen, David W.; Brown, William F.; and Steffen, Jim M., 4,548,347, Cl. 228-48.000.

Steidl, Larry E.: *See*—
Nixon, Bryan E.; Steidl, Larry E.; Amano, Itaru; Fujieda, Yasuhiko; Onishi, Hisaaki; and Miyauchi, Hideo, 4,548,564, Cl. 425-32.000.

Stein Associates, Inc.: *See*—
Hwang, Yong Y., 4,548,191, Cl. 126-21.00A.

Stein, Theodor, to Schering AG. Process for aeration of effluents in equalizing and reservoir basins. 4,548,715, Cl. 210-614.000.

Steinberg, Albert H.; Petruccelli, Frank; Lucas, Mariann E.; and Zlatkevich, Lev, to Allied Corporation. Rotational molding multilayered articles. 4,548,779, Cl. 264-255.000.

Steinberger, Helmut; Moretto, Hans-Heinrich; Michel, Werner; and Kniege, Wilfried, to Bayer Aktiengesellschaft. Elastomeric organopolysiloxanes containing polycarbodiimide-polysiloxane copolymers. 4,548,999, Cl. 525-453.000.

Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, to BASF Aktiengesellschaft. Sedative compositions containing 10-piperazino-5-cyanomethylenedibenzo[a,d]-cycloheptenes. 4,548,933, Cl. 514-255.000.

Steinkuhl, Bernd: *See*—
Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,548,444, Cl. 299-34.000.

Steinmann, Peter; Engel, Reinhard; Parstorfer, Richard; Brugger, Rudolf; and Jonke, Gerhard, to Siemens Aktiengesellschaft. Light waveguide welding device. 4,548,669, Cl. 156-358.000.
Stelco, Inc.: *See*—
LaPointe, Raymond L.; and Olmsted, John D., 4,549,269, Cl. 364-472.000.
Stendardo, William J. Apparatus for remote control of volume and power on electronic equipment possessing an audio output. 4,549,179, Cl. 340-825.690.
Stendel, Wilhelm: *See*—
Kruger, Bernd-Wieland; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,548,931, Cl. 514-141.000.
Stephensen, Charles B.: *See*—
Sack, David A.; and Stephensen, Charles B., 4,548,805, Cl. 424-9.000.
Sterling Drug Inc.: *See*—
Bailey, Denis M., 4,549,016, Cl. 544-165.000.
Stetter, Jorg: *See*—
Holmwood, Graham; Stetter, Jorg; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; and Scheinpflug, Hans, 4,548,945, Cl. 514-383.000.
Stevens, James C.; and Perettie, Donald J., to Dow Chemical Company, The. Selective photochlorination of 1,1-dichloroethane. 4,548,686, Cl. 204-158.0HA.
Stewart-Warner Corporation: *See*—
Mayer, William; and Runions, Alton E., 4,548,589, Cl. 445-4.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Forsthuber, Peter; Visek, Tomas; and Dolenc, Anton, 4,548,170, Cl. 123-195.00A.
Stickel, Karl D., to United States of America, Navy. Time-of-arrival pulsed waveform multiplexer. 4,549,294, Cl. 370-111.000.
Stilling, Johann. Sign structure. 4,547,987, Cl. 40-574.000.
Stinton, Robert T.: *See*—
Long, Richard W.; and Stinton, Robert T., 4,547,904, Cl. 2-2.10R.
Stipanovic, Arthur J., to Texaco, Inc. Method for oil recovery using a polymer containing fluid. 4,548,268, Cl. 166-270.000.
Stirrat, John C.; Hurley, Kenneth L.; and Whittaker, Brian F., to Delphax Systems. Toner feeder system. 4,548,490, Cl. 355-3.0DD.
Stockmann, Michael: *See*—
Auracher, Franz; and Stockmann, Michael, 4,548,464, Cl. 350-96.140.
Stodieck, Robert W.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,549,161, Cl. 338-20.000.
Stoerk, Peter; and Thom, Gunter, to Siemens Aktiengesellschaft. Releasable optical fiber connector having flexible webs and undersized grooves. 4,548,467, Cl. 350-96.210.
Stokes, Olen L., Jr.: *See*—
Cato, Robert T.; Dickson, LeRoy D.; and Stokes, Olen L., Jr., 4,548,463, Cl. 350-3.710.
Stoll, Bradley G.: *See*—
Dalke, Charles A.; and Stoll, Bradley G., 4,548,783, Cl. 376-204.000.
Stoll, Kurt. Electro fluidic circuit board assembly with fluid ducts and electrical connections. 4,549,248, Cl. 361-400.000.
Stolz, Albert; Volz, Wolfgang; and Sigmund, Gunther, to Daimler-Benz Aktiengesellschaft. Device for regulating heating capacity of a heat exchanger. 4,548,355, Cl. 236-37.000.
Storace, Louis: *See*—
Magee, Thomas A.; Battershell, Robert D.; Limpel, Lawrence E.; Ho, Andrew W.; Friedman, Arthur W.; Corkins, H. Glenn; Brand, William W.; Buchman, Russell; Storace, Louis; and Osgood, Edmond R., 4,548,929, Cl. 514-85.000.
Stowe, Lawrence R.; and Johnson, Warren F., to Mobil Oil Corporation. Controlled pulse fracturing. 4,548,252, Cl. 166-299.000.
Stranahan, Michael: *See*—
Lew, Hyok S.; and Stranahan, Michael, 4,547,929, Cl. 16-286.000.
Strawczynski, Leo: *See*—
Weirich, Andreas H.; and Strawczynski, Leo, 4,549,304, Cl. 375-27.000.
Strehlow, Robert J.: *See*—
Tamura, Paul S.; and Strehlow, Robert J., 4,549,073, Cl. 219-497.000.
Striebel, Edmund E.: *See*—
Sepulveda, Domingo; and Striebel, Edmund E., 4,548,032, Cl. 60-39.060.
Strimling, Walter E. Implantable heart pump. 4,547,911, Cl. 623-3.000.
Strolle, Clifford H.: *See*—
Cluff, Stephen L.; Strolle, Clifford H.; and Breazeale, Robert D., 4,548,963, Cl. 523-427.000.
Strong, Samuel Z., Jr. Bicycle gear shift unit. 4,548,092, Cl. 74-475.000.
Stroud, Lebern W. Four-five alternator coil winding. 4,549,106, Cl. 310-184.000.
Stutz, Hansruedi, to Loepfe Brothers Limited. Apparatus for measuring the length of filamentary material, such as yarn or thread wound-up at individual winding or spinning locations of a textile machine. 4,549,268, Cl. 364-470.000.
Suda, Masashi: *See*—
Sue, Yasuhiko; Ariga, Masao; Tamura, Yasuyuki; Nagashima, Nao; Miyagi, Ken; Nakaoka, Masaki; and Suda, Masashi, 4,549,219, Cl. 358-257.000.
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Sugden, David B.; Waddell, Bruce A.; Kindsvater, James P.; and Moffat, Robert B., to Robbins Company, The. Mobile mining machine and method. 4,548,442, Cl. 299-10.000.
Sugibuchi, Hiroyuki: *See*—
Akiba, Juji; Kobayashi, Satoru; and Sugibuchi, Hiroyuki, 4,549,171, Cl. 340-605.000.
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, to Takeda Chemical Industries, Ltd. 3-Amino-4-oxo-2,3,4,5-tetrahydro-1,5-benzoxazepine derivatives. 4,548,932, Cl. 514-211.000.
Sugihara, Taisuke: *See*—
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, 4,549,023, Cl. 546-199.000.
Sugimori, Shigeru; and Kojima, Tetsuhiko, to Chisso Corporation. 2,4-Difluorobenzene derivatives. 4,548,731, Cl. 252-299.630.
Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,548,558, Cl. 418-83.000.
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, to USV Pharmaceutical Co. Antihypertensive amides. 4,548,928, Cl. 514-232.000.
Suh, Nam P.; and Rinderle, James R., to Massachusetts Institute of Technology. Injection molding method. 4,548,773, Cl. 264-40.600.
Sukonick, Josef, to Cadtrak Corporation. Graphics data handling system for CAD workstation. 4,549,275, Cl. 364-521.000.
Sukornick, Bernard: *See*—
Nalewajek, David; Eibeck, Richard E.; and Sukornick, Bernard, 4,548,881, Cl. 429-194.000.
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Kayane, Yutaka; and Harada, Naoki, 4,548,612, Cl. 8-524.000.
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,548,769, Cl. 264-22.000.
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Koshino, Yoshinori; and Nakajima, Shiro, 4,548,301, Cl. 188-196.00C.
Ono, Kimizo, 4,548,505, Cl. 356-445.000.
Summers, Mark A., to United States of America, Energy. Reflex ring laser amplifier system. 4,549,144, Cl. 330-4.300.
Sunazuka, Hideo: *See*—
Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.
Sunbeam Plastics Corporation: *See*—
Montgomery, Gary V., 4,548,331, Cl. 220-253.000.
Sung, Rodney L.; and Davis, Marshall E., to Texaco Inc. Gasoline containing as additive poly(oxyethylene) poly(oxypropylene) poly-(oxyethylene) polyol to reduce octane requirement increase. 4,548,616, Cl. 44-77.000.
Sung, Rodney L.: *See*—
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Sunohara, Akira, to Nissan Shatai Company, Limited. Method for masking in painting process and masking tool therefor. 4,548,838, Cl. 427-282.000.
Supermarket Systems: *See*—
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Sutherland, David T.: *See*—
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Sutton, John H., III; and Chulay, Steven J., to Beckman Instruments, Inc. Centrifuge rotor and method of assembly. 4,548,596, Cl. 494-20.000.
Suzue, Seisuke: *See*—
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Suzuki, Etsuji; Uno, Shinichi; Chiyoda, Kiyomu; and Douji, Ryuhachirou, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for examining printed circuit board provided with miniaturized electronic parts. 4,549,206, Cl. 358-106.000.
Suzuki, Hirokazu; and Satoh, Kozo, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear magnetic resonance diagnostic apparatus. 4,549,137, Cl. 324-309.000.
Suzuki, Katsunori: *See*—
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Suzuki, Kazuhiro, to Ricoh Company, Ltd. Apparatus for processing image into binary data. 4,549,220, Cl. 358-283.000.
Suzuki, Kisaku. Food shaping apparatus. 4,548,571, Cl. 425-297.000.
Suzuki, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus and method for examining an object by nuclear magnetic resonance. 4,549,138, Cl. 324-309.000.
Suzuki, Mitsuo: *See*—
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Suzuki, Nobuyoshi: *See*—
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Suzuki, Ryushi; and Yamaga, Joji, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for separating dissolved gases and entrained bubbles from liquid. 4,548,622, Cl. 55-204.000.
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Suzuki, Shintaro; Fujita, Hirotsugu; Asami, Yoshiaki; and Homma, Fumiko, to Toshiba Battery Co., Ltd. Flat cell. 4,548,880, Cl. 429-162.000.

Suzuki, Takeomi. Proper focusing state detecting device. 4,548,495, Cl. 356-123.000.

Suzuki, Takeshi; and Suzue, Seisuke, to Daikin Kogyo Co., Ltd. Undercoating composition. 4,548,986, Cl. 525-66.000.

Swanson, Harley D.; McAninch, Terry L.; and Conner, J. Keith, to Birko Corporation. Depilating composition and method. 4,548,608, Cl. 8-94.160.

Swartz, Harold L.: *See—*
Heidel, Jeffrey C.; Hoogervorst, Thomas R.; Lane, Lynn R.; and Swartz, Harold L., 4,547,972, Cl. 33-366.000.

Sweet, Edmund G. F., to Ontario Research Foundation. Method and apparatus for soil mechanics measurements of filter cakes. 4,548,080, Cl. 73-432.0SD.

Swett, H. Darwin: *See—*
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Scharpey, Wilhelm, 4,548,692, Cl. 204-243.00R.

Switzgable, Harold. Thermally broken insulation support structure. 4,548,015, Cl. 52-729.000.

Sylvan R. Shemitz and Associates, Inc.: *See—*
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Syntex (U.S.A.) Inc.: *See—*
Muchowski, Joseph M.; Greenhouse, Robert; Ackrell, Jack; Li, Tsung-Tee; and Pfister, Jurg R., 4,548,949, Cl. 514-422.000.
Muchowski, Joseph M.; and Ackrell, Jack, 4,548,951, Cl. 514-522.000.

Szabo , Lajos: *See—*
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.

Szafranski, Brian D.: *See—*
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T.A.D. Avanti, Inc.: *See—*
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T.M.B. Fertilizer Pumps Ltd.: *See—*
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T&N Materials Research Limited: *See—*
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Tachibana, Akira; and Kiyoto, Masami, to Nissan Motor Company, Limited. Moving obstacle detection system for a vehicle. 4,549,181, Cl. 340-904.000.

Tacker, Willis A., Jr.; Bourland, Joe D.; Babbs, Charles F.; and Geddes, Leslie A., to Purdue Research Foundation. Sequential-pulse, multiple pathway defibrillation method. 4,548,203, Cl. 128-419.00D.

Tadlock, John W.: *See—*
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Taisei Corporation: *See—*
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Tajima, Hiroyuki: *See—*
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Takahashi, Katsuhiro; Watanabe, Keiichi; Hoshihara, Naoto; and Jinbo, Hiroyuki, to Matsushita Electric Industrial Company, Limited. Method for fabricating electrodes for use in lead storage batteries. 4,548,835, Cl. 427-123.000.

Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; and Kodama, Takuma, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha Ltd. Circuit for generating signal for correcting deflection of electron beam. 4,549,117, Cl. 315-371.000.

Takahashi, Takao: *See—*
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Takahashi, Toshinori: *See—*
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Takahata, Masaya: *See—*
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Takai, Sakan; Iida, Takenori; and Kaneko, Keiichi, to Fujitsu Limited. Magnetic bubble memory system. 4,549,282, Cl. 365-1.000.

Takamatsu, Toshiaki: *See—*
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Takashi, Ozawa, to Fuji Xerox Co., Ltd. Reading, printing and copying device. 4,549,223, Cl. 358-300.000.

Takasu, Yoshio: *See—*
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Takayama, Suguru: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
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Takeuchi, Shin: *See—*
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Tamba, Shinichi; Sato, Masato; Watanabe, Kozo; and Yamashita, Masanobu, to Kawasaki Jukogyo Kabushiki Kaisha. Suction air passage of internal combustion engine. 4,548,167, Cl. 123-41.560.

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Tamm, Rolf G. A.: *See—*
Huber, Bernhard; Tamm, Rolf G. A.; Tomoff, Toma; and Gonner, Winfried, 4,548,497, Cl. 356-312.000.

Tamura, Paul S.; and Strehlow, Robert J., to Oximetrix, Inc. Current controller for resistive heating element. 4,549,073, Cl. 219-497.000.

Tamura, Yasuyuki: *See—*
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Tanaka, Atsuo: *See—*
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Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; and Kiuchi, Tsutomu, to Victor Company of Japan, Limited. Circuit arrangement for digitizing and storing color video signal. 4,549,201, Cl. 358-13.000.

Tanaka, Keihachiro; and Yoshii, Shigekazu, to Nippon Sheet Glass Co., Ltd. Process for producing fine fibers from viscous materials. 4,548,632, Cl. 65-5.000.

Tanaka, Masanobu: *See—*
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Tanaka, Tomiho; and Osujo, Masahide, to Kubota, Ltd. Steering system of a vehicle. 4,548,291, Cl. 180-321.000.

Tanaka, Yasuhiko: *See—*
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Taniguchi, Koichi: *See—*
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Tanimoto, Yasufumi; and Ogura, Masahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse motor-driving circuit. 4,549,126, Cl. 318-696.000.

Tanuma, Itsuo: *See—*
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Taoda, Kiyomichi: *See—*
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Tarbuck, Robert R., to Sperry Corporation. Spiral orbital shear apparatus. 4,548,111, Cl. 83-196.000.

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Taylor, Andrew J.; and McGillvray, Philip J., to Electronic Designs (I.W.) Limited. Battery charging. 4,549,127, Cl. 320-21.000.
Taylor, Kenneth E.: *See—*
Reiner, Martin J.; and Taylor, Kenneth E., 4,548,255, Cl. 164-361.000.
Taylor, Lloyd D.: *See—*
Kolesinski, Henry S.; and Taylor, Lloyd D., 4,548,981, Cl. 524-555.000.
Taylor, Mark L.: *See—*
Sells, Richard L.; and Taylor, Mark L., 4,548,285, Cl. 177-1.000.
Taylor, Paul H., to Tayco Developments, Inc. Electrically operated valve, piston and cylinder assembly incorporating said valve, and self-contained system including pressurized fluid and hydraulic actuator. 4,548,041, Cl. 60-632.000.
TBT Tiefbohrtechnik GmbH & Co. KG: *See—*
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TDK Corporation: *See—*
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Nakayama, Masatoshi; and Izumi, Toshiaki, 4,548,864, Cl. 428-336.000.
TDK Electronics Co., Ltd.: *See—*
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Teass, Horace A., Jr. Salinity indicator system. 4,549,141, Cl. 324-441.000.
Technicare Corporation: *See—*
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Technology Application Services Corporation: *See—*
Camacho, Salvador L.; and Camacho, David P., 4,549,065, Cl. 219-121.0PM.
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Holdredge, Ernest C., Jr., 4,548,776, Cl. 264-50.000.
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Shibata, Fumio; and Kawasaki, Shunzo, 4,548,848, Cl. 428-85.000.
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Telecommunications Radioelectriques et Telephoniques: *See—*
Guidoux, Loic B. Y., 4,549,049, Cl. 179-175.31E.
Telefongyar: *See—*
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Tenedini, Kenneth J.; and Sutherland, David T., to VirTis Company, Inc., The. Freeze dryer with improved temperature control. 4,547,977, Cl. 34-46.000.
Tenhagen, Rolf: *See—*
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Terauchi, Kiyoshi, to Sanden Corporation. Interfitting mechanism of spiral elements for scroll-type fluid displacement apparatus. 4,548,556, Cl. 418-55.000.
Terry, Robert G.: *See—*
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Terumo Kabushiki Kaisha: *See—*
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Tewfik, Farouk F. Liquid volume indicator. 4,549,164, Cl. 340-59.000.
Texaco Inc.: *See—*
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McEntire, Edward E.; Knifton, John F.; Nieh, Edward C. Y.; and Sellstrom, Kathy B., 4,549,017, Cl. 544-168.000.
Morris-Sherwood, Betty J.; Brink, Edward C., Jr.; McCoy, David R.; and McEntire, Edward E., 4,548,726, Cl. 252-75.000.
Stipanovic, Arthur J., 4,548,268, Cl. 166-270.000.
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Texas Instruments Incorporated: *See—*
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Calder, Powell L., 4,549,263, Cl. 364-200.000.
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Tezuka, Sadao; Tanaka, Yasuhiko; Matsumura, Kunihiko; Yamamoto, Tadao; Suzuki, Nobuyoshi; and Tsurukawa, Toshio, to Olympus Optical Co., Ltd. Liquid containing vessel with temperature control device. 4,548,259, Cl. 165-14.000.
Thais, William; and Kauth, William. Shoe with ankle protector. 4,547,981, Cl. 36-89.000.
Theeuwes, Felix, to ALZA Corporation. Parenteral agent dispensing equipment. 4,548,598, Cl. 604-85.000.
Theeuwes, Felix: *See—*
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Thiebaut, Bernard A., to Inmont Corporation. Lithographic water based fountain solution concentrates. 4,548,645, Cl. 106-2.000.
Thom, Gunter: *See—*
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Thoma, Friedrich X., to Dieter Graesslin Feinwerktechnik. Magnetically retentive programmable switching control device. 4,549,154, Cl. 335-87.000.
Thomas, Anthony J.: *See—*
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Thomas & Betts Corporation: *See—*
Bawa, Jaspal S.; Couto, Luis R.; Rapacki, Edward S.; Wood, Alfred; and Pobuta, Walter A., deceased, 4,549,037, Cl. 174-65.0SS.
Thomas, Richard H., to Marquip, Inc. Web cutting. 4,548,112, Cl. 83-345.000.
Thompson, Craig R.; and Naumann, Ted F., Jr., to General Electric Company. Ultrasonic scanning apparatus and positioning system. 4,548,374, Cl. 248-123.100.
Thompson, Mark S.; and Adams, Charles T., to Shell Oil Company. Hydrodenitrification catalyst. 4,548,920, Cl. 502-219.000.
Thompson, Maynard L., to Honeywell Inc. Method of spacing the folds of a folded filter media. 4,547,950, Cl. 29-445.000.
Thompson, Paul J.: *See—*
Remes, R. Scott; and Thompson, Paul J., 4,548,335, Cl. 220-466.000.
Thompson, Steven J.: *See—*
Hester, Troy L.; Thompson, Steven J.; and Long, James R., 4,547,974, Cl. 33-537.000.
Thomsen, Svend E.; and Christensen, Thorkild, to Danfoss A/S. Hydraulic control apparatus for a servomotor. 4,548,035, Cl. 60-384.000.
Thomson-CSF: *See—*
Arditty, Herve ; and Graindorge, Philippe, 4,548,631, Cl. 65-3.100.
Fleury, Georges, 4,549,112, Cl. 315-3.600.
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Chapman, John M.; and Antonis, Basil, 4,549,251, Cl. 362-216.000.
Tin, Kam B., to AEL Microtel Limited. Memory access control circuit. 4,549,273, Cl. 364-200.000.
Tippmann, Eugene R., to Lakeview Window Corporation. Removable sash guide for window frames. 4,547,995, Cl. 49-457.000.
Tisma Machine Corporation: *See—*
Tisma, Steven, 4,548,593, Cl. 493-56.000.
Tisma, Steven, to Tisma Machine Corporation. Folding carton for dry powder. 4,548,593, Cl. 493-56.000.
TMC Corporation: *See—*
Spitaler, Engelbert, 4,548,424, Cl. 280-612.000.
Tobin, Philip J., to Motorola, Inc. Surface denuding of silicon wafer. 4,548,654, Cl. 148-1.500.
Tocco, Inc.: *See—*
Anderson, Keith, 4,549,057, Cl. 219-10.790.
Toda Kogyo Corp.: *See—*
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,548,801, Cl. 423-594.000.
Togo Japan Inc.: *See—*
Yamada, Kazuo, 4,548,136, Cl. 105-91.000.
Tokai Carbon Co., Ltd.: *See—*
Akiyama, Masaru; Yamada, Jotaro; and Takahata, Masaya, 4,548,774, Cl. 264-44.000.
Tokiwa Kanpo Pharmaceutical Co., Ltd.: *See—*
Iwamura, Junichi, 4,548,831, Cl. 426-634.000.
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Koyama, Sadao, 4,548,830, Cl. 426-620.000.
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, to Rengo Co., Ltd. Apparatus for positioning tools. 4,548,109, Cl. 83-71.000.
Tokuyama Sekisui Industry Corporation, Ltd.: *See—*
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.
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Komura, Seiichi, 4,548,373, Cl. 248-122.000.
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Aoyama, Shuki, 4,549,054, Cl. 219-10.55R.

Enjoji, Susumu; and Saito, Koji, 4,548,210, Cl. 128-660.000.
Kaneko, Nagao; Fujimori, Yoshinori; Shimizu, Seizaburo; and Obara, Shin, 4,549,107, Cl. 310-327.000.
Kondo, Takeo, 4,549,198, Cl. 357-42.000.
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Mine, Susumu; and Ishizaka, Takao, 4,549,156, Cl. 335-216.000.
Miyatani, Takashi; Nakata, Junji; Seki, Kisuke; and Kageyama, Takafumi, 4,548,617, Cl. 51-293.000.
Okatsuka, Hisashi; Taniguchi, Koichi; and Kakizawa, Toshio, 4,549,056, Cl. 219-10.770.
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Suzuki, Etsuji; Uno, Shinichi; Chiyoda, Kiyomu; and Douji, Ryuhachirou, 4,549,206, Cl. 358-106.000.
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Tomasetti, Charles M.: *See—*
Savoye, Eugene D.; and Tomasetti, Charles M., 4,547,957, Cl. 29-572.000.

Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Eliminating the low-frequency chrominance signal for tracking in a video tape recorder. 4,549,226, Cl. 358-328.000.

Tomlinson, Christopher J.: *See—*
Isaman, David L.; Perloff, Ronald S.; and Tomlinson, Christopher J., 4,549,292, Cl. 370-89.000.

Tomlinson, Thomas L. Wire caddy. 4,548,368, Cl. 242-129.600.

Tomoff, Toma: *See—*
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Topperwien, Bernd; and Krause, Lothar, to Maschinenfabrik Goebel GmbH. Perforating device. 4,548,113, Cl. 83-345.000.

Toray Industries, Inc.: *See—*
Ono, Masaaki; Motegi, Masahiko; and Okabe, Kazuo, 4,548,855, Cl. 428-147.000.
Yokota, Mitsuru; Fujioka, Shuji; Goshima, Tsutomu; Kenjo, Hideki; and Komaki, Kazushige, 4,548,983, Cl. 524-726.000.

Torobin, Leonard B. Solar collector comprising transparent hollow plastic microspheres as insulation material. 4,548,196, Cl. 126-443.000.

Tortrix A/S: *See—*
Pedersen, Jan B., 4,548,364, Cl. 242-4.00B.

Toshiba Battery Co., Ltd.: *See—*
Suzuki, Shintaro; Fujita, Hirotsugu; Asami, Yoshiaki; and Homma, Fumiko, 4,548,880, Cl. 429-162.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
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Toth, Istvan: *See—*
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Totten, Thomas B., to Flexillume Canada Ltd. Lighting fixture. 4,549,253, Cl. 362-364.000.

Townsend, Max F., to Economatics (Education) Limited. Computer controlled mobile device. 4,548,584, Cl. 434-118.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,548,985, Cl. 525-65.000.

Toyo Tire & Rubber Co., Ltd.: *See—*
Nagata, Takayoshi; and Hashiyama, Mitsuaki, 4,548,980, Cl. 524-495.000.

Toyoda Koki Kabushiki Kaisha: *See—*
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Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,548,126, Cl. 92-213.000.
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,548,253, Cl. 164-80.000.
Ishida, Yasuhiko; Mori, Taiichi; Hikita, Shigeyuki; and Horiba, Tamotsu, 4,548,625, Cl. 55-282.000.
Kawai, Taiyo; Habu, Nobuo; and Matsumoto, Shinichi, 4,548,175, Cl. 123-308.000.
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Trummer, Gabor, to Kontakta Alkatreszgyar. Screw fixing element. 4,548,534, Cl. 411-61.000.

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Betts, Bruce A., 4,548,643, Cl. 75-124.000.

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Tsuge, Hisanao; and Yoshida, Takayoshi, to NEC Corporation. Method of producing a Josephson tunnel barrier. 4,548,834, Cl. 427-63.000.

Tsuji, Nobuo: *See—*
Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, 4,548,873, Cl. 428-695.000.

Tsuji, Takashi, to Nippon Zeon Co., Ltd. Method and system for driving blood pumping devices. 4,548,550, Cl. 417-390.000.

Tsumiyama, Hisanori: *See—*
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Tsurukawa, Toshio: *See—*
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Tunberg, Robert A., to Whitey's Ice Cream Manufacturers, Inc. Protective sleeve for a paper cup. 4,548,349, Cl. 229-1.50H.

Turner, Andrew D.: *See—*
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Turner, Garland L.: *See—*
Cordova, Colleen W.; Mago, Brij M.; Turner, Garland L.; and Braswell, William D., 4,548,866, Cl. 428-398.000.

Turner, John, to Robbins Company, The. Tunnel boring machine. 4,548,443, Cl. 299-31.000.

Tweedie, Thomas D.: *See—*
McGhee, James B.; and Tweedie, Thomas D., 4,549,159, Cl. 337-301.000.

Ueda, Shigeta; Hombu, Mitsuyuki; and Matsuda, Yasuo, to Hitachi, Ltd. Gate control circuit for current-type inverter apparatus. 4,549,259, Cl. 363-137.000.

Uehara, Seigo; Yamanouchi, Hiroshi; and Kuji, Mitsugu, to Sony Corporation. Tape machine. 4,549,237, Cl. 360-71.000.

Ueno, Hideo, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter. 4,548,520, Cl. 400-63.000.

Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Fluorine-containing synthetic resin shaped articles having improved surface properties and a method for the preparation thereof. 4,548,867, Cl. 428-409.000.

Ueno, Toshishige: *See—*
Yagitani, Takayuki; Matsui, Hiromasa; Ito, Akira; and Ueno, Toshishige, 4,548,745, Cl. 252-567.000.

Ukai, Akitoshi: *See—*
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Ulijasz, Thaddeus R., to Cooper Industries, Inc. Electro-optical signal processing systems and devices. 4,549,085, Cl. 250-551.000.

Ulmer, Jamie F. Electric safety switch. 4,549,097, Cl. 307-326.000.

Ultralight Flight, Inc.: *See—*
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UMC Industries, Inc.: *See—*
Press, Irving D.; and Lane, Charles S., 4,548,427, Cl. 285-55.000.

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Uneback, Hans I.: *See—*
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Simpson, Howard D., 4,548,710, Cl. 208-216.0PP.
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Union Siderurgique du Nord et de L'est de la France (USINOR): *See—*
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United Kingdom Atomic Energy Authority: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Bertero, Mario; and Pike, Edward R., 4,549,204, Cl. 352-93.000.
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Agriculture: *See—*
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Escallier, Edward A.; Dawson, Stanley R.; and Shaheen, Joseph M., 4,548,661, Cl. 156-52.000.
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Bregoli, Lawrence J., 4,548,876, Cl. 429-39.000.
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Burklund, Patrick W., 4,548,266, Cl. 166-250.000.
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United Technologies Automotive, Inc.: *See*—
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DelMastro, Bartolomeo P.; and Eckart, Frederick, 4,549,058, Cl. 219-121.0LC.
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Seitelman, Leon H.; and Kaveckas, Edward J., 4,548,531, Cl. 409-9.000.
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University of Illinois, The Board of Trustees of the: *See*—
Rinehart, Kenneth L., Jr., 4,548,814, Cl. 424-95.000.
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Malhi, Satwinder D.; and Salama, Clement A., 4,549,193, Cl. 357-22.000.
Uno, Shinichi: *See*—
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Pearlman, Bruce A., 4,549,030, Cl. 549-435.000.
Van Rheenen, Verlan H., 4,548,748, Cl. 260-239.55C.
Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Parenteral controlled therapy. 4,548,599, Cl. 604-85.000.
Ursprung, Cecil E.: *See*—
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USM Corporation: *See*—
Allen, Christopher M.; and Hinchklieff, Ian R., 4,548,989, Cl. 525-101.000.
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Martin, John F.; and Ripley, Donald E., 4,548,115, Cl. 83-409.000.
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USV Pharmaceutical Co.: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,548,928, Cl. 514-232.000.
Vaidya, Ashok W., to EMI Limited. Magnetic field gradiometer with trimming element. 4,549,135, Cl. 324-248.000.
Valenta, Joseph R.: *See*—
Bowie, Betty A.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,548,974, Cl. 424-118.000.
Valint, Paul L., Jr.: *See*—
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Valmet OY: *See*—
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Van Appledorn, William, to Prince Corporation. Robot apparatus particularly adapted for removing and handling die cast parts. 4,548,544, Cl. 414-751.000.
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Vandenberk, Jan: *See*—
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van de Plassche, Rudy J., to U.S. Philips Corporation. Switching amplifier. 4,549,145, Cl. 330-51.000.
van der Burgt, Maarten J., to Shell Oil Company. Process for transporting particulate material from a low pressure zone to a gas-containing elevated pressure zone. 4,548,529, Cl. 406-53.000.
Vander Haeghe, Hubert J. H. E.: *See*—
De Clercq, Erik D. A.; Vander Haeghe, Hubert J. H. E.; and Busson, Roger H. C., 4,548,819, Cl. 424-253.000.
van der Kooij, Willem P. Method for flush mounting a washing unit in a working leaf or the like and strip to be used with this method. 4,547,951, Cl. 29-450.000.
Vanderlaan, Robert D., to Pneumo Corporation. Electro-mechanical direct drive valve servo system with rotary to linear valve drive mechanism. 4,548,089, Cl. 74-60.000.
Van Der Schoot, Alexander P. M.: *See*—
Langeraar, Huibert B.; and Van Der Schoot, Alexander P. M., 4,549,286, Cl. 367-97.000.
van der Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannes C. M., to U.S. Philips Corporation. Coffee maker. 4,548,129, Cl. 99-281.000.
van Die, Willem. Bale pick-up claw apparatus. 4,548,535, Cl. 414-111.000.
Van Gurp, Wilhelmus A. J.: *See*—
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van Leusen, Adriaan M.: *See*—
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van Leusen, Albert M.; and van Leusen, Adriaan M., to Gist-Brocades N.V. Process for the preparation of 21-hydroxy-20-keto-Δ^{16}-steroids and new intermediate compounds formed in this process. 4,548,749, Cl. 260-239.500.
vanManen, Dick T., to Voplex Corporation. Extrusion cladding of base strip for cushioned automotive strap handle. 4,547,954, Cl. 29-458.000.
van Putten, Antonius F. P. Ambient temperature compensated double bridge anemometer. 4,548,077, Cl. 73-204.000.
Van Rheenen, Verlan H., to Upjohn Company, The. Cyanohydrin process. 4,548,748, Cl. 260-239.55C.
Varian Associates: *See*—
Marzec, Willy; and Tallis, Allen A., 4,548,365, Cl. 242-4.00R.
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Verkler, Charles E., to International Food Equipment Inc. Frozen dessert mixer. 4,548,508, Cl. 366-195.000.
Vernicolor AG: *See*—
Widmer, Hans R.; and Schmid, Christian, 4,549,000, Cl. 525-482.000.
Vernocchi, Vittorio: *See*—
Ravinale, Stefano; and Vernocchi, Vittorio, 4,548,518, Cl. 384-490.000.
Victor Company of Japan, Limited: *See*—
Fukuda, Tomeichiro; Soda, Takashi; Furukawa, Ikuo; Hayashi, Takushi; Kumata, Fujio; and Nagano, Susumu, 4,548,777, Cl. 264-107.000.
Kondo, Hikaru, 4,549,147, Cl. 330-297.000.
Nakamura, Mutsuaki; Namikawa, Kazuhira; Goshima, Toshikazu; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,548,739, Cl. 252-511.000.
Namiki, Yasuomi, 4,549,231, Cl. 360-14.200.
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Watanabe, Yasuaki, 4,549,225, Cl. 358-316.000.

Vincent, Harold L., to Dow Corning Corporation. Anionic siliconates of silylorganocarboxylates, sulfonates and phosphonates to reduce viscosities of particulate slurries. 4,548,733, Cl. 252-310.000.

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Tenedini, Kenneth J.; and Sutherland, David T., 4,547,977, Cl. 34-46.000.

Visek, Tomas: *See—*
Forsthuber, Peter; Visek, Tomas; and Dolenc, Anton, 4,548,170, Cl. 123-195.00A.

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Vogts, Heinz P.: *See—*
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Voicemail International, Inc.: *See—*
Brian, Dow V.; and Hawes, Samuel R., 4,549,047, Cl. 179-18.00B.

Voigt, Manfred: *See—*
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Stolz, Albert; Volz, Wolfgang; and Sigmund, Gunther, 4,548,355, Cl. 236-37.000.

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Vonder, David L.: *See—*
Reimer, William A.; and Vonder, David L., 4,548,450, Cl. 339-17.00C.

Von Gruenberg, Gregory: *See—*
Huang, Jen-chi; Von Gruenberg, Gregory; and Riley, Donald J., 4,548,683, Cl. 204-129.400.

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Voplex Corporation: *See—*
vanManen, Dick T., 4,547,954, Cl. 29-458.000.

Vorobiev, Ivan Y.; Zharnov, Viktor M.; and Naumenko, Viktor D., to Minsky Motorny Zavod. Internal combustion engine. 4,548,165, Cl. 123-41.840.

Voss, Gunther; and Gruber, Peter, to Boehringer Ingelheim GmbH. Method for ink-jet printing on uncoated tablets or uncoated tablet cores. 4,548,825, Cl. 426-383.000.

Voss, Roy N.: *See—*
Masheris, Fred; Michaels, Leonard H.; Scott, William J.; and Voss, Roy N., 4,549,038, Cl. 174-65.0SS.

Vyhnal, Richard F., to Rockwell International Corporation. Stretch-forming tool. 4,548,065, Cl. 72-413.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Klatt, Alfred, 4,548,079, Cl. 73-432.00R.

Wach, Stanislaw P.: *See—*
Kalubowila, Prematilaka W.; Wach, Stanislaw P.; and Levens, Michael B., 4,549,043, Cl. 174-133.00R.

Wach, Thaddeus F., to Armstrong World Industries, Inc. Ceiling product. 4,548,854, Cl. 428-138.000.

Wachi, Masatada; and Katoh, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Digital filter for an electronic musical instrument. 4,548,119, Cl. 84-1.190.

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Wacker, Oskar: *See—*
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Waddell, Bruce A.: *See—*
Sugden, David B.; Waddell, Bruce A.; Kindsvater, James P.; and Moffat, Robert B., 4,548,442, Cl. 299-10.000.

Wadley, Donald K.; and Gordon, Philip, to Hewlett Packard Company. Dot image buffer and dot sequence scrambler for dot matrix line printer. 4,548,134, Cl. 101-93.040.

Wagner, Alfred, to AT&T Bell Laboratories. Correction of lithographic masks. 4,548,883, Cl. 430-5.000.

Wagner, Joseph P.; and Sliger, Boyd P., to Robertshaw Controls Company. Vehicle-type thermostat construction and method of making the same. 4,548,354, Cl. 236-345.000.

Waldstrom, Ejvind, to O. G. Hoyer A/S. Method and an apparatus for producing moulded confection articles. 4,548,573, Cl. 425-442.000.

Walker, Francis H.; and Baker, Don R., to Stauffer Chemical Company. Herbicides: N,N-dialkyl-2-(4-substituted-1-naphthoxy) propionamides. 4,548,641, Cl. 71-118.000.

Walker, William J.: *See—*
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Waller, James E., to Des Case Corporation. Hygroscopic breather cap. 4,548,624, Cl. 55-274.000.

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Walter, John: *See—*
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Wang, Cheng-Chung. Inflatable article with reforming and reinforcing structure. 4,547,919, Cl. 5-455.000.

Wapner, Herbert H., to Baka Manufacturing Company, Inc. Endotracheal tube holder. 4,548,200, Cl. 128-207.170.

Warburton, Alan W., to United States of America, Navy. Precision fathometer interface adaptor. 4,549,177, Cl. 340-825.570.

Ward, Robert W.; Smith, Stephen A.; and Markwell, Roger E., to Beecham Group p.l.c. Anti-inflammatory and analgesic benzothiophene and benzafuran derivatives, compositions, and method of use therefor. 4,548,948, Cl. 514-422.000.

Warner-Lambert Company: *See—*
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Warner-Lambert Technologies, Inc.: *See—*
Michalik, John K., 4,549,149, Cl. 331-66.000.

Warnick, Debra A.: *See—*
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Warren, Craig B.: *See—*
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,548,764, Cl. 261-75.000.

Warshawsky, Jerome. Articulable joint. 4,548,446, Cl. 339-2.00A.

Wasaki, Masaru: *See—*
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Takahashi, Katsuhiro; Watanabe, Keiichi; Hoshihara, Naoto; and Jinbo, Hiroyuki, 4,548,835, Cl. 427-123.000.

Watanabe, Koya; Yamazaki, Katuo; and Hayama, Sadaji, to Toshiba Kikai Kabushiki Kaisha. Attachments for fitting tools to spindles. 4,548,532, Cl. 409-233.000.

Watanabe, Kozo: *See—*
Tamba, Shinichi; Sato, Masato; Watanabe, Kozo; and Yamashita, Masanobu, 4,548,167, Cl. 123-41.560.

Watanabe, Yasuaki, to Victor Company of Japan, Ltd. Color video signal processing circuit for performing level control and time axis deviation compensation. 4,549,225, Cl. 358-316.000.

Watari, Yoshio, to Hitachi, Ltd. Nuclear reactor power control system. 4,548,784, Cl. 376-216.000.

Watchorn, Ernest W., to Confloat Consulting Ltd. Buoyant concrete foundation and method therefor. 4,548,153, Cl. 114-267.000.

Waters, John H.: *See—*
Bishop, Christopher J.; Cumner, Geoffrey M.; and Waters, John H., 4,548,527, Cl. 405-294.000.

Watkins, James D., to Golden Valley Foods Inc. Method for increasing the volumetric yield of microwave cooked popcorn. 4,548,826, Cl. 426-394.000.

Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, to Aisin-Warner K. K. Torque ratio control device for a V-belt type continuously variable transmission. 4,548,099, Cl. 74-689.000.

Weaver, Otha G., Jr., to Olin Corporation. 3,4-Disubstituted polypyrroles and articles of manufacture coated therewith. 4,548,696, Cl. 204-290.00R.

Weaver, William N., to Illinois Tool Works Inc. Bottle multi-package and multi-packaging device. 4,548,317, Cl. 206-162.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
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Webb-Waring Lung Institute: *See—*
Filley, Giles F.; and Kindig, Neal B., 4,548,817, Cl. 424-127.000.

Weber, Erich, to Martin GmbH fur Umwelt- und Energietechnik. Grate for industrial furnaces. 4,548,139, Cl. 110-328.000.

Weber, Peter, to SKW Trostberg A.G. Process for the production of pure burnt lime. 4,548,796, Cl. 423-175.000.

Wedtech Corp.: *See—*
Pinkhasov, Eduard, 4,548,670, Cl. 156-617.0SP.

Wegemund, Bernd: *See—*
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Wehrli, Felix W.: *See—*
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Weiblen, Richard, to TBT Tiefbohrtechnik GmbH & Co. KG. Reboring tool. 4,548,530, Cl. 408-79.000.

Weigand, Larry J.: *See—*
Lee, Robert C.; Weigand, Larry J.; and Merideth, Jeffrey O., 4,548,405, Cl. 272-69.000.

Weikel, William A.: *See—*
Kelly, Lawrence S.; McCormick, Marty P.; and Weikel, William A., 4,548,652, Cl. 134-22.120.

Weinheimer, Alois: *See—*
Romeike, Arno; Regner, Richard; and Weinheimer, Alois, 4,547,932, Cl. 17-45.000.

Weirich, Andreas H.; and Strawczynski, Leo, to Northern Telecom Limited. ADPCM Encoder/decoder with signalling bit insertion. 4,549,304, Cl. 375-27.000.

Weise, Carlos; Wolfer, Dietrich; and Patzke, Jorg, to Wacker-Chemie GmbH. Flame-resistant molding compositions containing oxides or hydroxides of rare earth elements. 4,548,979, Cl. 524-403.000.

Weiss, Isaac; Froes, Francis H.; and Eylon, Daniel, to United States of America, Air Force. Method to reveal microstructures in single phase alloys. 4,548,903, Cl. 436-5.000.

Weiss, Thomas M., to Dow Chemical Company, The. Moisture probe and technique. 4,549,134, Cl. 324-61.00R.

Weldotron Corporation: *See—*
Fine, Harvey A., 4,548,024, Cl. 53-502.000.

Welk, John R., to Motorola, Inc. Multicolor display from monochrome or multicolor control unit. 4,549,172, Cl. 340-703.000.

Weller, Nicholas J.: *See—*
Badalamenti, Vito; and Weller, Nicholas J., 4,548,574, Cl. 425-531.000.

Wendorff, Donn. Trailer support stand. 4,548,418, Cl. 280-1.000.
Wentzek, Horst F.: *See—*
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Werguin, Jean C.: *See—*
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Werner, Jesse: *See—*
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,549,007, Cl. 528-76.000.
Wessel, Wolf: *See—*
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Westcott, Martha L.: *See—*
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Western Digital Corporation: *See—*
Chung, Randall M.; and Rossean, Larry D., 4,549,262, Cl. 364-200.000.
Westfall, Geoffrey J.; and Haase, Franklin D., to Westfall, Geoffrey J. Mastitis prevention. 4,548,807, Cl. 424-45.000.
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Bluzer, Nathan, 4,549,195, Cl. 357-30.000.
Kub, Francis J., 4,549,196, Cl. 357-35.000.
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Westvaco Corporation: *See—*
Choy, Edmund M.; and Baran, Mark E., 4,548,649, Cl. 106-213.000.
Duncan, Don P.; and Cameron, Timothy B., 4,548,746, Cl. 260-104.000.
Wevers, Jean; Ernst, Hubert; Cassidy, Stephen; and Barrat, Christian R., to Procter & Gamble Company, The. Aqueous aminomethylene-phosphonic acid solutions containing organic carboxylate stabilizing agent. 4,548,757, Cl. 260-502.50E.
Whirlpool Corporation: *See—*
Kohler, Charles F., 4,549,055, Cl. 219-10.55R.
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Rajgopal, Premkumar, 4,548,049, Cl. 62-275.000.
Whiscombe, John B.: *See—*
Evans, Dain S.; Georgiou, George A.; Mossman, Peter; Mukherjee, Arabinda; and Whiscombe, John B., 4,548,466, Cl. 350-96.200.
White, Allan E., to RCA Corporation. Panel seal and support structure for fiber optic cable. 4,548,465, Cl. 350-96.200.
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Paterson, James G. T.; and Whitener, Charles G., Jr., 4,548,611, Cl. 8-477.000.
Whitey's Ice Cream Manufacturers, Inc.: *See—*
Tunberg, Robert A., 4,548,349, Cl. 229-1.50H.
Whittaker, Brian F.: *See—*
Stirrat, John C.; Hurley, Kenneth L.; and Whittaker, Brian F., 4,548,490, Cl. 355-3.0DD.
Whittington, Lawrence E.: *See—*
DeBons, Francis E.; Whittington, Lawrence E.; and Pedersen, Larry D., 4,548,721, Cl. 252-8.55D.
Wical, Robert M. Planned coordinate component placement system. 4,548,667, Cl. 156-356.000.
Wick, Alexander E., to Hoffmann-La Roche Inc. 4-Pyridone-3-carboxylic acid derivatives. 4,549,022, Cl. 546-193.000.
Widmer, Hans R.; and Schmid, Christian, to Vernicolor AG. Thermosetting powder lacquer for covering weld seams. 4,549,000, Cl. 525-482.000.
Wiegand, Walter J.: *See—*
Nighan, William L.; Wiegand, Walter J.; and Ferrar, Carl M., 4,549,109, Cl. 313-485.000.
Wielders, Pierre G. E.; and Leinders, Robert, to Medtronic, Inc. Energy converter for implantable cardioverter. 4,548,209, Cl. 128-419.00D.
Wiener, David M., to W^2 Vehicle Design & Development, Inc. Recumbent vehicle. 4,548,421, Cl. 280-281.0LP.
Wilcockson, Alan: *See—*
Woodhead, James L.; Scott, Keith T.; and Wilcockson, Alan, 4,548,832, Cl. 427-34.000.
Williams, Bruce E.: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,548,928, Cl. 514-232.000.
Williams, Carl L., Jr.; and Payne, Larry R., to LaJet Energy Company. Reflector with easily replaceable reflective membrane. 4,548,482, Cl. 350-608.000.
Williams, Ian G., to Imperial Chemical Industries PLC. Flame retardant polyamide compositions. 4,548,972, Cl. 524-100.000.
Williams, John L. Mobile apparatus for the infield handling of fibrous material. 4,548,131, Cl. 100-1.000.
Williamson, D. Leroy, to United States of America, Agriculture. Visual-olfactory habitat mimic for assessment of fruit fly response to behavior-modifying chemicals. 4,548,804, Cl. 424-9.000.
Williamson, William R. Bayonet tube heat exchanger. 4,548,257, Cl. 165-1.000.
Willimczik, Wolfhart. Rotary unit. 4,548,559, Cl. 418-136.000.
Wilson, Hillis L.: *See—*
Wirth, Robert L.; and Wilson, Hillis L., 4,548,521, Cl. 400-124.000.
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., to BASF Wyandotte Corporation. Aqueous liquids containing metal cavitation-erosion corrosion inhibitors. 4,548,787, Cl. 422-15.000.
Wingerden, Arie V. Apparatus for carrying plural plants to a watering station. 4,547,992, Cl. 47-17.000.
Winklmann, Erwin: *See—*
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Winski, Dennis A., to Moore Special Tool Co., Inc. Jig grinder with automatic C-axis feedrate control. 4,547,996, Cl. 51-165.710.
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Wirth Maschinen-Und Bohrgerate-Fabrik GmbH: *See—*
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Wirth, Robert L.; and Wilson, Hillis L., to NCR Corporation. Dot matrix print head. 4,548,521, Cl. 400-124.000.
Wirz, Armin; and Nabulon, Werner, to Rieter Machine Works, Ltd. Chuck drive system. 4,548,366, Cl. 242-18.0DD.
Wisconsin Alumni Research Foundation: *See—*
Muller, Michael F.; and Ferry, John D., 4,548,736, Cl. 252-315.100.
Wittenbecher, Hasso: *See—*
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Wohlgemuth, Werner: *See—*
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Wojnicki, John. Apparatus for horizontally forming, filling and sealing film pouch material. 4,548,018, Cl. 53-51.000.
Wolf, Nicholas O.; and Yang, Kang, to Conoco Inc. Use of high ethoxylate low carbon atom amines for simultaneous removal of sulfonate surfactants and water from recovered crude oil. 4,548,707, Cl. 208-188.000.
Wolf, Rudiger: *See—*
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Wolfer, Dietrich: *See—*
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Wolff, William F., to Amoco Corporation. Method for extraction solvent recovery. 4,548,701, Cl. 208-11.0LE.
Wolfges, Hans, to Mannesmann Rexroth GmbH. Electrically controlled pressure relief valve including a hydraulic bias. 4,548,233, Cl. 137-529.000.
Wolfges, Hans, to Mannesmann Rexroth GmbH. Electrically controlled pressure reducing valve. 4,548,383, Cl. 251-129.000.
Wolthausen, Edward C., to Crown Zellerbach Corporation. Ultrasonic softness testing system. 4,548,081, Cl. 73-584.000.
Wood, Alfred: *See—*
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Woodhead, James L.; Scott, Keith T.; and Wilcockson, Alan, to United Kingdom Atomic Energy Authority. Materials. 4,548,832, Cl. 427-34.000.
Woods, Billy E. Fitting for dual submersible pumps. 4,548,263, Cl. 166-105.000.
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Legler, John G.; Bartlett, Robert L.; Haas, Charles J.; Woods, Garry W.; and Clark, John O., 4,548,246, Cl. 144-1.00C.
Woodward, Oakley M., to RCA Corporation. Cross-polarization corrector for circular waveguide. 4,549,310, Cl. 455-129.000.
Worcester, Winthrop S., to B. F. Goodrich Company, The. Conveyor belt splicing. 4,548,663, Cl. 156-159.000.
Worrallo, Anthony C. Display and shelf support bracket and the like. 4,548,378, Cl. 248-558.000.
Wright, Antony P.: *See—*
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W^2 Vehicle Design & Development, Inc.: *See—*
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Wu, Tai T.: *See—*
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Wu, Tai-Wing, to Eastman Kodak Company. Reagent composition, dry element and method for determination of total bilirubin. 4,548,905, Cl. 436-97.000.
Wyatt, Philip J.; and Quist, Gregory M. Process and apparatus for identifying or characterizing small particles. 4,548,500, Cl. 356-336.000.
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Driessen, Wilhelmus G. M., 4,549,244, Cl. 361-229.000.
Eiland, Harry F., 4,548,491, Cl. 355-3.00R.
Xolox Corporation: *See—*
Loubier, Robert J., 4,549,157, Cl. 335-303.000.
Yabe, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece with voice memory. 4,548,511, Cl. 368-10.000.
Yabe, Yuichiro: *See—*
Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, 4,548,926, Cl. 514-19.000.
Yabumoto, Toshio; Sakaoka, Hiromu; and Nakajima, Koji, to Honda Giken Kogyo Kabushiki Kaisha. Secondary intake device. 4,548,173, Cl. 123-308.000.
Yagitani, Takayuki; Matsui, Hiromasa; Ito, Akira; and Ueno, Toshishige, to Kureha Kagaku Kogyo Kabushiki Kaisha. Capacitor com-

prising metallized polypropylene film impregnated with a certain bis-(alkylphenyl) alkane. 4,548,745, Cl. 252-567.000.

Yaklin, Leonard L., to American Specialty & Supply, Inc. Taping machines. 4,548,022, Cl. 53-415.000.

Yamada, Jotaro: *See*—
Akiyama, Masaru; Yamada, Jotaro; and Takahata, Masaya, 4,548,774, Cl. 264-44.000.

Yamada, Kazuo, to Togo Japan Inc. Track-traveling four-wheel vehicle. 4,548,136, Cl. 105-91.000.

Yamada, Kenji, to Nippon Kogaku K.K. Variable magnification observation optical device. 4,548,481, Cl. 350-559.000.

Yamada, Motoshige; and Ebato, Seigo, to Mitsubishi Paper Mills, Ltd. Photosensitive material for diffusion transfer with antihalation layer containing white and color pigment. 4,548,898, Cl. 430-510.000.

Yamada, Shigemichi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,548,101, Cl. 74-720.000.

Yamada, Takashi; and Shimamoto, Mamoru, to Nippondenso Company, Ltd. Periodic signal detecting circuit including comparator circuit with variable threshold and varying time constant. 4,549,099, Cl. 307-359.000.

Yamaga, Joji: *See*—
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Yamagami, Yousuke: *See*—
Nishida, Takeshi; Yamagami, Yousuke; Takeda, Toshihide; and Saito, Toshio, 4,547,906, Cl. 2-93.000.

Yamagiwa, Tokio; Ishikawa, Toshio; Ozawa, Jun; Endo, Kaoru; and Hosokawa, Masao, to Hitachi, Ltd. Method of testing and verifying a performance for insulation to ground of a disconnecting switch when breaking a charging current. 4,549,132, Cl. 324-54.000.

Yamaguchi, Kiyoshi: *See*—
Nobuhara, Masahiro; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,548,900, Cl. 435-68.000.

Yamaji, Katsuhiko; Nakata, Yasushi; Kawai, Shigeyuki; Hagihara, Tatumi; Kageyama, Koji; and Okazaki, Yasushi, to Sekisui Kagaku Kogyo Kabushiki Kaisha; and Mazda Motor Corporation. Method and device for preheating an engine or an engine intake air. 4,548,186, Cl. 123-556.000.

Yamamoto, Hiroshi: *See*—
Kamejima, Kohji; Yamamoto, Hiroshi; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Honma, Kazuo, 4,549,208, Cl. 358-108.000.

Yamamoto, Nobuyuki; Mukaida, Yoshito; Tsuji, Nobuo; Higaki, Yuzo; and Okamura, Toshihisa, to Fuji Photo Film Co., Ltd. Magnetic recording media with oxyfatty acid lubricant. 4,548,873, Cl. 428-695.000.

Yamamoto, Sakuei; Nishida, Mitsuhiro; Inao, Hiroshi; Tashiro, Noboru; and Hani, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Submergible motor including circuit element encased in molded plug. 4,549,105, Cl. 310-87.000.

Yamamoto, Tadao: *See*—
Tezuka, Sadao; Tanaka, Yasuhiko; Matsumura, Kunihiko; Yamamoto, Tadao; Suzuki, Nobuyoshi; and Tsurukawa, Toshio, 4,548,259, Cl. 165-14.000.

Yamamoto, Tadashi; and Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Video signal transmitting system. 4,549,221, Cl. 358-288.000.

Yamamoto, Yoshiharu; Nakajima, Yasuo; and Nagaoka, Yoshitomi, to Matsushita Electric Industrial Co., Ltd. Projection lens apparatus. 4,548,480, Cl. 350-432.000.

Yamanoi, Kiyoshi: *See*—
Nakaso, Akishi; Yamanoi, Kiyoshi; Okamura, Toshiro; and Tsuru, Yoshiyuki, 4,548,644, Cl. 106-1.230.

Yamanouchi, Hiroshi: *See*—
Uehara, Seigo; Yamanouchi, Hiroshi; and Kuji, Mitsugu, 4,549,237, Cl. 360-71.000.

Yamashita, Masanobu: *See*—
Tamba, Shinichi; Sato, Masato; Watanabe, Kozo; and Yamashita, Masanobu, 4,548,167, Cl. 123-41.560.

Yamato, Akihiro, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling the operating condition of an internal combustion engine. 4,548,180, Cl. 123-478.000.

Yamato Scientific Co., Ltd.: *See*—
Morikawa, Tatsumi; Ozawa, Yoshio; Kawakami, Takao; and Yoshida, Naoki, 4,548,128, Cl. 98-115.300.

Yamauchi, Koji: *See*—
Matsuoka, Shigeru; Yamauchi, Koji; Tadokoro, Hiroyuki; Yonekura, Seiji; and Suzuki, Mitsuo, 4,549,092, Cl. 307-116.000.

Yamauchi, Takahiko; Seki, Teruo; and Aoyama, Keizo, to Fujitsu Limited. Semiconductor device providing a contact structure which can be miniaturized. 4,549,199, Cl. 357-68.000.

Yamawaki, Yoshiro: *See*—
Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, 4,548,154, Cl. 114-355.000.

Yamazaki, Katuo: *See*—
Watanabe, Koya; Yamazaki, Katuo; and Hayama, Sadaji, 4,548,532, Cl. 409-233.000.

Yamazaki Machinery Works, Ltd.: *See*—
Fukumura, Naoe; Hasegawa, Shunji; and Tanaka, Masanobu, 4,549,270, Cl. 364-474.000.

Yamazaki, Masayasu: *See*—
Hatano, Hirofumi; Yamazaki, Masayasu; Sasaki, Atsushi; Mikami, Keigo; Taoda, Kiyomichi; and Murakami, Mitsuharu, 4,548,580, Cl. 432-106.000.

Yamazaki, Mitsuo: *See*—
Matsueda, Rei; Yabe, Yuichiro; Yamazaki, Mitsuo; Kokubu, Tatsuo; and Hiwada, Kunio, 4,548,926, Cl. 514-19.000.

Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,549,034, Cl. 17-17.0LF.

Yang, James H. C.: *See*—
Dubich, Charles S.; and Yang, James H. C., 4,548,016, Cl. 52-749.000.

Yang, Kang: *See*—
Wolf, Nicholas O.; and Yang, Kang, 4,548,707, Cl. 208-188.000.

Yasuda, Shuuhei: *See*—
Funada, Fumiaki; Takamatsu, Toshiaki; Yasuda, Shuuhei; and Matsuura, Masataka, 4,549,174, Cl. 340-784.000.

Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, to Toyo Seikan Kaisha, Ltd. Hot-melt adhesive. 4,548,985, Cl. 525-65.000.

Yeh, Pochi A., to Rockwell International Corporation. Isophase birefringent filters. 4,548,479, Cl. 350-404.000.

Ylonen, Paavo; Hirvikoski, Urpo; Piippo, Esa; and Rajala, Pentti, to Valmet OY. Engine driven generator assembly. 4,548,164, Cl. 123-2.000.

Yohe, Warren C., to General Electric Company. Coated carbide cutting tool insert. 4,548,786, Cl. 419-29.000.

Yokokawa, Yoshio: *See*—
Nemoto, Yuhei; Shigeta, Sadaaki; and Yokokawa, Yoshio, 4,548,889, Cl. 430-273.000.

Yokota, Mitsuru; Fujioka, Shuji; Goshima, Tsutomu; Kenjo, Hideki; and Komaki, Kazushige, to Toray Industries, Inc. Method of manufacturing shaped article of hydrogel. 4,548,983, Cl. 524-726.000.

Yonekura, Seiji: *See*—
Matsuoka, Shigeru; Yamauchi, Koji; Tadokoro, Hiroyuki; Yonekura, Seiji; and Suzuki, Mitsuo, 4,549,092, Cl. 307-116.000.

Yonezawa, Kazuma; Tanda, Toshikuni; and Ishitobi, Hirotake, to Kawasaki Steel Corporation. Surface treatment of zinc alloy electroplated steel strips. 4,548,868, Cl. 428-446.000.

Yonezu, Ikuo: *See*—
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,548,044, Cl. 62-48.000.

Yoo, Young S.: *See*—
Salmon, John K.; and Yoo, Young S., 4,548,297, Cl. 187-20.000.

Yoon, Inbae. Elastic ligating ring clip. 4,548,201, Cl. 128-326.000.

York, Earl D.; Johnson, David M.; and Miller, Paul B., to Standard Oil Company; and Gulf Oil Corporation. Shale oil stabilization with a hydroprocessor. 4,548,702, Cl. 208-11.00R.

York-Shipley, Inc.: *See*—
Korenberg, Jakob, 4,548,138, Cl. 110-245.000.

Yoshida, Hiroshi; and Murasaki, Ryuichi, to Yoshida Kogyo K. K. Apparatus for producing hooks on loop-and-hook fasteners. 4,548,116, Cl. 83-444.000.

Yoshida, Junko: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Yoshida, Junko; Okano, Kazuo; Sezaki, Masaji; and Itoh, Tatsuo, 4,548,816, Cl. 424-116.000.

Yoshida Kogyo K. K.: *See*—
Yoshida, Hiroshi; and Murasaki, Ryuichi, 4,548,116, Cl. 83-444.000.

Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, to Nippon Light Metal Company Limited. Process of producing magnetic recording media. 4,548,682, Cl. 204-35.100.

Yoshida, Naoki: *See*—
Morikawa, Tatsumi; Osawa, Yoshio; Kawakami, Takao; and Yoshida, Naoki, 4,548,128, Cl. 98-115.300.

Yoshida, Takao: *See*—
Hall, John B.; and Yoshida, Takao, 4,548,821, Cl. 426-3.000.

Yoshida, Takayoshi: *See*—
Tsuge, Hisanao; and Yoshida, Takayoshi, 4,548,834, Cl. 427-63.000.

Yoshida, Tomohiko; and Mori, Hiroshi, to Mitsubishi Rayon Co., Ltd. Flame-retardant polyester resin composition. 4,548,964, Cl. 523-455.000.

Yoshida, Yasuharu, to Nec Corporation. Phase demodulator including variable phase shifter for controlling reference carrier. 4,549,142, Cl. 329-50.000.

Yoshii, Shigekazu: *See*—
Tanaka, Keihachiro; and Yoshii, Shigekazu, 4,548,632, Cl. 65-5.000.

Yoshii, Yuji: *See*—
Hiraga, Masaharu; and Yoshii, Yuji, 4,548,555, Cl. 418-55.000.

Yoshikawa, Masao, to Canon Kabushiki Kaisha. Device for forming a thin layer of developer. 4,548,489, Cl. 355-3.0DD.

Yoshino, Akira: *See*—
Shingo, Yoshioki; Matsuda, Takao; Yoshino, Akira; Sunazuka, Hideo; Hasegawa, Masatake; and Kobayashi, Hirotada, 4,549,041, Cl. 174-113.00R.

Yoshino, Tetsuya; Kageyama, Takashi; Kato, Kazuo; and Kishido, Takeshi, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for coating. 4,548,837, Cl. 427-209.000.

Yoshioka, Toshio: *See*—
Murata, Seiichiro; Yoshioka, Toshio; Kamei, Sakito; Hiramatsu, Yoshitada; Takeuchi, Shin; and Yamawaki, Yoshiro, 4,548,154, Cl. 114-355.000.

Young, Alan S.: *See*—
Pigott, Keith R.; Macartney, Michael J.; and Young, Alan S., 4,548,419, Cl. 280-203.000.

Young, David E. Rotating shaft seal and bearing lubricating apparatus. 4,548,283, Cl. 175-107.000.

Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Hydrocracking with catalytically active amorphous silica and zeolites. 4,548,705, Cl. 208-111.000.

Young, James G.: *See*—
Colliopoulos, John A.; Paul, David B.; and Young, James G., 4,548,806, Cl. 424-35.000.
Yuki, Ikuo, to Hitachi, Ltd. Focusing voltage output circuit for cathode ray tube. 4,549,216, Cl. 358-242.000.
Zabrocki, Karl: *See*—
Bauer, Wolfgang; Lindner, Christian; Muller, Friedemann; Kress, Hans-Jurgen; Zabrocki, Karl; and Buekers, Josef, 4,548,987, Cl. 525-67.000.
Zahler, Robert, to E. R. Squibb & Sons, Inc. 3-Acylamino-1-sulfonylaminocarbonylmethoxy-2-azetidinones. 4,548,747, Cl. 260-239.00A.
Zajer nee Balazs, Maria: *See*—
Szantay, Csaba; Szabo , Lajos; Kalaus, Gyorgy; Sapi, Janos; Zajer nee Balazs, Maria; Kiss, Bela; Ezer, Elemer; Karpati, Egon; and Szporny, Laszlo , 4,549,020, Cl. 546-51.000.
Zaltsberg, Leib. Aerodynamic damper for suppressing galloping in overhead transmission lines. 4,549,035, Cl. 174-42.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., to Leggett & Platt, Incorporated. Coil spring assembly machine. 4,548,241, Cl. 140-89.000.
Zaruba, Wenzel. Tool extractor. 4,548,279, Cl. 173-170.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyamideimides prepared by reacting either lactams or polyamides with polyisocyanates and anhydrides using a lactam as an additive. 4,548,970, Cl. 524-98.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyamideimides produced from either lactams or polyamides with isocyanates and anhydrides as thermoplasts. 4,549,006, Cl. 528-73.000.
Zeiler, Hans-Joachim: *See*—
Fengler, Gerd; Arlt, Dieter; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,548,934, Cl. 514-225.000.
Zeller, Gregor; and Bonn, Helmut, to Petri A.G. Electrical contact for a vehicle steering device. 4,548,454, Cl. 339-3.00S.
Zens, Albert P., to Varian Associates, Inc. Controlled susceptibility plugs. 4,549,136, Cl. 324-308.000.
Zero-Max Industries, Incorporated: *See*—
Anderson, Conrad V., 4,548,305, Cl. 192-56.00R.
Zharnov, Viktor M.: *See*—
Vorobiev, Ivan Y.; Zharnov, Viktor M.; and Naumenko, Viktor D., 4,548,165, Cl. 123-41.840.
Zhujun, Zhang: *See*—
Seitz, William R.; and Zhujun, Zhang, 4,548,907, Cl. 436-163.000.
Zimmer, Ernst, to Kuka Schweissanlagen & Roboter GmbH. Manipulator drive. 4,548,097, Cl. 74-665.00M.
Zimmer, Max: *See*—
Mathis, Paul; and Zimmer, Max, 4,548,507, Cl. 366-20.000.
Zincroksid S.p.A.: *See*—
Lavezzari, Carlo, 4,548,872, Cl. 428-633.000.
Zinser, Georg: *See*—
Staudenrausch, Georg; Abt, Franz; Kern, Manfred; and Zinser, Georg, 4,547,931, Cl. 17-1.00F.
Zlatkevich, Lev: *See*—
Steinberg, Albert H.; Petruccelli, Frank; Lucas, Mariann E.; and Zlatkevich, Lev, 4,548,779, Cl. 264-255.000.
Zoecon Corporation: *See*—
Christianson, Michael L.; Warnick, Debra A.; and Carlson, Peter S., 4,548,901, Cl. 435-241.000.
Zofchak, Albert. Method of lubricating the skin. 4,548,810, Cl. 424-59.000.
Zucker, Fritz: *See*—
Huber, Walter; and Zucker, Fritz, 4,548,334, Cl. 220-293.000.
Zur, Alexander: *See*—
Ruttenberg, Alexander; and Zur, Alexander, 4,548,551, Cl. 417-393.000.
Zwijsen, Wilhelmus A. J. M.: *See*—
Bouland, Maurice; Van Gurp, Wilhelmus A. J.; and Zwijsen, Wilhelmus A. J. M., 4,549,143, Cl. 329-126.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF OCTOBER, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ames, Adolf: *See*—
Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, Re. 32,008, Cl. 228-155.000.

AT&T Bell Laboratories: *See*—
Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,012, Cl. 381-43.000.

Collins, Philip W., to Minnesota Mining and Manufacturing Company. Dispenser for liner-wound tape. Re. 32,010, Cl. 156-527.000.

Exxon Research and Engineering Co.: *See*—
Ledford, Thomas H.; and Lerner, Howard, Re. 32,009, Cl. 423-578.00R.

Fulcher, Carol A.: *See*—
Zimmerman, Theodore S.; and Fulcher, Carol A., Re. 32,011, Cl. 260-112.00B.

Hodel, Ulf: *See*—
Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, Re. 32,008, Cl. 228-155.000.

Ledford, Thomas H.; and Lerner, Howard, to Exxon Research and Engineering Co. Degassing molten sulfur. Re. 32,009, Cl. 423-578.00R.

Lerner, Howard: *See*—
Ledford, Thomas H.; and Lerner, Howard, Re. 32,009, Cl. 423-578.00R.

Minnesota Mining and Manufacturing Company: *See*—
Collins, Philip W., Re. 32,010, Cl. 156-527.000.

Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., to AT&T Bell Laboratories. Spoken word controlled automatic dialer. Re. 32,012, Cl. 381-43.000.

Rabiner, Lawrence R.: *See*—
Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,012, Cl. 381-43.000.

Rosenberg, Aaron E.: *See*—
Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,012, Cl. 381-43.000.

Scripps Clinic and Research Foundation: *See*—
Zimmerman, Theodore S.; and Fulcher, Carol A., Re. 32,011, Cl. 260-112.00B.

Swiss Aluminium Ltd.: *See*—
Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, Re. 32,008, Cl. 228-155.000.

Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, to Swiss Aluminium Ltd. Process for manufacturing plastically deformed light metal objects having a connector part of a different metal. Re. 32,008, Cl. 228-155.000.

Wilpon, Jay G.: *See*—
Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,012, Cl. 381-43.000.

Zimmerman, Theodore S.; and Fulcher, Carol A., to Scripps Clinic and Research Foundation. Ultrapurification of factor VIII using monoclonal antibodies. Re. 32,011, Cl. 260-112.00B.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Baxter Travenol Laboratories, Inc.: *See*—
Zdeb, Brian D., B1 4,412,573, Cl. 604-415.000.

Cullom Machine Tool & Die, Inc.: *See*—
Dickhut, Heinrich; and Lilienthal, Alfred, B1 4,439,130, Cl. 425-388.000.

Dickhut, Heinrich; and Lilienthal, Alfred, to Cullom Machine Tool & Die, Inc. Plastic tile corrugator. B1 4,439,130, 10-22-85, Cl. 425-388.000.

Doty, Myron L., to Moorfeed Corporation. Dual drive rotary feeder. B1 4,429,808, 10-22-85, Cl. 221-167.000.

Fearing, D. David, to Fearing Manufacturing Co., Inc. Marking tag. B1 4,209,924, 10-22-85, Cl. 40-301.000.

Fearing Manufacturing Co., Inc.: *See*—
Fearing, D. David, B1 4,209,924, Cl. 40-301.000.

Forest Laboratories, Inc.: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., B1 4,389,393, Cl. 424-19.000.

Gaylord, Norman G.: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., B1 4,389,393, Cl. 424-19.000.

Howard, Charlie J.: *See*—
Peart, Edward L.; and Howard, Charlie J., B1 4,445,789, Cl. 374-198.000.

Lilienthal, Alfred: *See*—
Dickhut, Heinrich; and Lilienthal, Alfred, B1 4,439,130, Cl. 425-388.000.

Miller, Eldon S. Articulated link conveyor. B1 1,030,035, 10-22-85, Cl. 198-850.000.

Moorfeed Corporation: *See*—
Doty, Myron L., B1 4,429,808, Cl. 221-167.000.

Nigalaye, Ashok: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., B1 4,389,393, Cl. 424-19.000.

Peart, Edward L.; and Howard, Charlie J., to Sybron Corporation. Thermometer of other instrument assembly. B1 4,445,789, 10-22-85, Cl. 374-198.000.

Riker Laboratories, Inc.: *See*—
Wade, James J., B1 4,477,450, Cl. 514-222.000.

Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., to Forest Laboratories, Inc. Sustained release therapeutic compositions based on high molecular weight hydroxypropylmethylcellulose. B1 4,389,393, 10-22-85, Cl. 424-19.000.

Sybron Corporation: *See*—
Peart, Edward L.; and Howard, Charlie J., B1 4,445,789, Cl. 374-198.000.

Wade, James J., to Riker Laboratories, Inc. Triazolo[4,3-c]pyrimidines substituted by nitrogen-containing heterocyclic rings. B1 4,477,450, 10-22-85, Cl. 514-222.000.

Zdeb, Brian D., to Baxter Travenol Laboratories, Inc. Injection site. B1 4,412,573, 10-22-85, Cl. 604-415.000.

LIST OF DESIGN PATENTEES

Adler Instrument Company: *See*—
Davison, John A., 281,104, Cl. D24-27.000.
Ainsworth Nominees Pty. Ltd.: *See*—
Smyth, Richard E., 281,085, Cl. D21-37.000.
Airway Industries, Inc.: *See*—
Weiner, Bruce, 281,034, Cl. D3-48.000.
Antoni, Patricia A.; and Kurinsky, Roger A., to Ekco Products, Inc. Covered food container. 281,042, 10-22-85, Cl. D7-5.000.
Appel, Mel, to Mel Appel Company, The. Sled. 281,060, 10-22-85, Cl. D12-10.000.
Arnold, Don C.; and Wilcox, Thomas J., to Indiana Brass, Inc. Faucet. 281,095, 10-22-85, Cl. D23-23.000.
Arnold, Don C.; and Wilcox, Thomas C., to Indiana Brass, Inc. Faucet. 281,096, 10-22-85, Cl. D23-23.000.
Arnold, Don C.; and Wilcox, Thomas C., to Indiana Brass, Inc. Faucet. 281,097, 10-22-85, Cl. D23-25.000.
Austin, Arnold S., to Quabaug Rubber Company. Shoe sole. 281,032, 10-22-85, Cl. D2-320.000.
B.M.X. Products, Inc.: *See*—
Hess, Stanley C., 281,062, Cl. D12-169.000.
Bandai Co., Ltd.: *See*—
Murakami, Katsushi, 281,088, Cl. D21-150.000.
Murakami, Katsushi, 281,089, Cl. D21-150.000.
Murakami, Katsushi, 281,090, Cl. D21-150.000.
Bridge Wheel Company, Inc.: *See*—
De Raad, Merle M., 281,063, Cl. D12-217.000.
Brossier, Jean-Michel. Trash receptacle. 281,110, 10-22-85, Cl. D34-4.000.
Brown Jordan Company: *See*—
Thorpe, Robert K., 281,038, Cl. D6-445.000.
Brunstrom, Leif E. I., to Telefonaktiebolaget LM Ericsson. Radio. 281,069, 10-22-85, Cl. D14-70.000.
Brunswick Corporation: *See*—
Heimovics, John G.; Robbins, Richard J.; Fee, Robert W.; and Liu, Shau-Min, 281,093, Cl. D22-25.000.
Bush, William G.; and Iseman, Diane R., to Drackett Company, The. Air freshener. 281,102, 10-22-85, Cl. D23-150.000.
Cal-Tuf Glass Corporation: *See*—
Farmer, Gary L.; and Leuder, Donald E., 281,052, Cl. D8-394.000.
Campbell, William J.; and Diaz, Gerard, to Technical Support Services, Inc. Shelf. 281,040, 10-22-85, Cl. D6-574.000.
Cesaroni, William C.; and Rauen, Robert P., to Dart Industries Inc. Combined casserole with reversible cover. 281,050, 10-22-85, Cl. D7-360.000.
Chadwick Management Services Pty. Limited: *See*—
Thomas, Norman I.; and Ilgoutz, Gunther, 281,106, Cl. D25-68.000.
Citizen Watch Co., Ltd.: *See*—
Koizumi, Ken; Koizumi, Michio; and Iwata, Yasuo, 281,078, Cl. D18-22.000.
Koizumi, Michio; Washimine, Osamu; Kozasa, Ken; Osawa, Seiichi; and Moriya, Takashi, 281,080, Cl. D18-23.000.
Kunita, Masao; Washimine, Osamu; Koizumi, Michio; Iwata, Yasuo; and Kurihara, Toshio, 281,079, Cl. D18-23.000.
Kurihara, Toshio; Yasunaga, Makoto; Kunita, Masao; Osawa, Seiichi; and Moriya, Takashi, 281,076, Cl. D18-22.000.
Yasunaga, Makoto; Kunita, Masao; Masuda, Katsuya; and Osawa, Seiichi, 281,077, Cl. D18-22.000.
Colquitt, Simone, to Syracuse China Corporation. Plate or similar article. 281,045, 10-22-85, Cl. D7-33.000.
Colquitt, Simone, to Syracuse China Corporation. Transfer or the like for chinaware or similar articles. 281,047, 10-22-85, Cl. D7-39.000.
Conair Corporation: *See*—
Rittenhouse, James M., 281,105, Cl. D28-35.000.
Cooke, John C., to Kleski & Associates, Inc.; and Third National Bank and Trust Company, The. Automatic teller station. 281,114, 10-22-85, Cl. D99-28.000.
CPG Products Corp.: *See*—
Norton, John J.; and Underhill, Michael, 281,086, Cl. D21-87.000.
Curry, Lois A. Door stop. 281,053, 10-22-85, Cl. D8-402.000.
Dart Industries Inc.: *See*—
Cesaroni, William C.; and Rauen, Robert P., 281,050, Cl. D7-360.000.
Wolff, Martin J., 281,048, Cl. D7-79.000.
Davison, John A., to Adler Instrument Company. Serrated surgical scissors. 281,104, 10-22-85, Cl. D24-27.000.
de La Tour, Odette. Booklet with wedding cassette and card. 281,056, 10-22-85, Cl. D9-337.000.
De Raad, Merle M., to Bridge Wheel Company, Inc. Folded wheel block. 281,063, 10-22-85, Cl. D12-217.000.
Diaz, Gerard: *See*—
Campbell, William J.; and Diaz, Gerard, 281,040, Cl. D6-574.000.
Dombroski, Edward, to Peerless Tube Company. Collapsible tube. 281,055, 10-22-85, Cl. D9-302.000.
Dow Chemical Company, The: *See*—
Kosinski, James E.; Hutter, Wayne R.; and Moses, Paul J., 281,099, Cl. D23-72.000.
Drackett Company, The: *See*—
Bush, William G.; and Iseman, Diane R., 281,102, Cl. D23-150.000.
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Antoni, Patricia A.; and Kurinsky, Roger A., 281,042, Cl. D7-5.000.
Etchison, Richard C. Overhead door weighing scale. 281,057, 10-22-85, Cl. D10-91.000.
Everhan, Walter. Saucer. 281,044, 10-22-85, Cl. D7-30.000.
Farmer, Gary L.; and Leuder, Donald E., to Cal-Tuf Glass Corporation. Sheet glass connector. 281,052, 10-22-85, Cl. D8-394.000.
Fee, Robert W.: *See*—
Heimovics, John G.; Robbins, Richard J.; Fee, Robert W.; and Liu, Shau-Min, 281,093, Cl. D22-25.000.
Fluckiger, E., to Robo Products Ltd. Portable electric heater. 281,100, 10-22-85, Cl. D23-77.000.
Gabriel, Edwin Z. Educational electronic experimentation laboratory. 281,083, 10-22-85, Cl. D19-62.000.
Gertler, Leona. Scale. 281,058, 10-22-85, Cl. D10-92.000.
Gilligan, Edward L. Baseball cap or the like. 281,031, 10-22-85, Cl. D2-244.000.
Hama Hamaphot KG Hanke & Thomas: *See*—
Hanke, Rudolph, 281,073, Cl. D16-45.000.
Hanke, Rudolph, to Hama Hamaphot KG Hanke & Thomas. Clamp and table stand. 281,073, 10-22-85, Cl. D16-45.000.
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4,548,151
260 4,548,152
267 4,548,153
355 4,548,154
362 4,548,155

CLASS 116

70 4,548,156
308 4,548,157

CLASS 118

24 4,548,158
728 4,548,159

CLASS 119

1 4,548,160
14.17 4,548,161

CLASS 122

7 R 4,548,162
13 R 4,548,163

CLASS 123

2 4,548,164
41.56 4,548,167
41.84 4,548,165
52 M 4,548,166
90.54 4,548,168
195 A 4,548,170
195 C 4,548,169
230 4,548,171
298 4,548,172
308 4,548,173
4,548,175
310 4,548,174
342 4,548,176
357 4,548,177
440 4,548,179
478 4,548,178
4,548,180
492 4,548,181
501 4,548,182
547 4,548,183
556 4,548,186
557 4,548,187
569 4,548,184
571 4,548,185

CLASS 124

41 A 4,548,188
4,548,189
56 4,548,190

CLASS 126

21 A 4,548,191
25 R 4,548,192
30 4,548,193
110 R 4,548,194
424 4,548,195
443 4,548,196

CLASS 128

4 4,548,197
92 A 4,548,199
207.17 4,548,200
303.17 4,548,207
326 4,548,201
327 4,548,198
334 C 4,548,202
419 D 4,548,203
4,548,209
4,548,208
419 F 4,548,210
660 4,548,211
700 4,548,204
736 4,548,212
748 4,548,205
772 4,548,206
774 4,548,289

CLASS 130

24 4,548,213
27 AE 4,548,214

CLASS 131

84.4 4,548,215
94 4,548,216
235.1 4,548,217

CLASS 132

39 4,548,218
91 4,548,219

CLASS 133

3 H 4,548,220

CLASS 134

11 4,548,651
22.12 4,548,652
141 4,548,221

CLASS 135

24 4,548,222

CLASS 136

251 4,549,033

CLASS 137

1 4,548,223
15 4,548,224
78.3 4,548,225
91 4,548,226
268 4,548,227
4,548,228
270 4,548,229
369 4,548,230
491 4,548,231
519 4,548,232
529 4,548,233
543.19 4,548,234
557 4,548,235
615 4,548,236
625.22 4,548,237
625.25 4,548,238
625.68 4,548,239

CLASS 138

30 4,548,240

CLASS 140

89 4,548,241
123.6 4,548,242

CLASS 141

114 4,548,243
156 4,548,244
237 4,548,245

CLASS 144

1 C 4,548,246
357 4,548,247

CLASS 148

1.5 4,548,654
3 4,548,653
111 4,548,655
4,548,656
133 4,548,657
175 4,548,658

CLASS 149

18 4,548,659
21 4,548,660

CLASS 150

52 R 4,548,249

CLASS 156

52 4,548,661
86 4,548,662
159 4,548,663
166 4,548,664
197 4,548,665
245 4,548,666
356 4,548,667
357 4,548,668
358 4,548,669
527 Re.32,010

617 SP 4,548,670
643 4,548,671
646 4,548,672

CLASS 160

331 4,548,250

CLASS 162

4 4,548,673
5 4,548,674
26 4,548,675
135 4,548,676
139 4,548,677
146 4,548,678

CLASS 163

5 4,548,251

CLASS 164

80 4,548,253
112 4,548,254
361 4,548,255
529 4,548,256

CLASS 165

1 4,548,257
4,548,258
14 4,548,259
78 4,548,260
82 4,548,261
111 4,548,262

CLASS 166

105 4,548,263
139 4,548,264
140 4,548,265
250 4,548,266
268 4,548,267
270 4,548,268
276 4,548,269
291 4,548,270
4,548,271
295 4,548,272
299 4,548,252
348 4,548,273

CLASS 169

51 4,548,274

CLASS 171

14 4,548,275

CLASS 172

166 4,548,276
265 4,548,277

CLASS 173

121 4,548,278
170 4,548,279

CLASS 174

42 4,549,035
52 FP 4,549,036
65 SS 4,549,037
4,549,038
72 R 4,549,039
92 4,549,040
113 R 4,549,041
114 R 4,549,042
133 R 4,549,043

CLASS 175

40 4,548,280
55 4,548,281
61 4,548,282
107 4,548,283
346 4,548,284

CLASS 177

1 4,548,285
4,548,286
25 4,548,287
180 4,548,288

CLASS 179

5 R 4,549,044
6.03 4,549,045
6.11 4,549,046
18 B 4,549,047
170.2 4,549,048
175.31 E 4,549,049

CLASS 180

9.1 4,548,290
321 4,548,291

CLASS 181

295 4,548,292

CLASS 182

99 4,548,293
206 4,548,294

CLASS 186

63 4,548,295

CLASS 187

17 4,548,296
20 4,548,297
25 4,548,298
29 R 4,548,299

CLASS 188

73.1 4,548,300
196 C 4,548,301

CLASS 192

0.076 4,548,307
3.31 4,548,303
46 4,548,304
56 R 4,548,305
70.28 4,548,306
106.2 4,548,302
4,548,308
4,548,309
4,548,310
4,548,311

CLASS 198

392 4,548,312
430 4,548,313
712 4,548,314
728 4,548,315
835 4,548,316
850 B1 Re.30,035

CLASS 200

314 4,549,050

CLASS 204

1 T 4,548,679
4,548,680
2.1 4,548,681
35.1 4,548,682
129.4 4,548,683
130 4,548,684
146 4,548,685
158 HA 4,548,686
159.17 4,548,687
159.18 4,548,688
159.23 4,548,689
4,548,690
192 P 4,548,691
243 R 4,548,692
252 4,548,693
257 4,548,694
284 4,548,695
290 R 4,548,696
4,548,697
298 4,548,698
4,548,699

CLASS 206

162 4,548,317
314 4,548,319
509 4,548,320
525 4,548,321
526 4,548,322
611 4,548,323
621 4,548,318

CLASS 208

10 4,548,700
11 LE 4,548,701
11 R 4,548,702
22 4,548,703
4,548,704
111 4,548,705
130 4,548,706
188 4,548,707
196 4,548,708
213 4,548,709
216 PP 4,548,710
309 4,548,711

CLASS 210

194 4,548,712
198.2 4,548,713
232 4,548,714
614 4,548,715
652 4,548,716
670 4,548,717
719 4,548,718
732 4,548,719

CLASS 211

58 4,548,324
69.5 4,548,325
71 4,548,326
187 4,548,327
205 4,548,328

CLASS 215

216 4,548,329

CLASS 219

10.49 R 4,549,051
4,549,052
10.55 M 4,549,053
10.55 R 4,549,054
4,549,055
10.77 4,549,056
10.79 4,549,057
56.21 4,549,059
59.1 4,549,060
69 G 4,549,061
69 W 4,549,062
121 EK 4,549,067
121 LC 4,549,058
121 LG 4,549,066
121 LJ 4,549,063
121 LM 4,549,064
121 PM 4,549,065
137.63 4,549,068
204 4,549,069
269 4,549,070
270 4,549,071
400 4,549,072
497 4,549,073
505 4,549,074

CLASS 220

210 4,548,330
253 4,548,331
268 4,548,332
276 4,548,333
293 4,548,334
466 4,548,335

CLASS 221

167 B1 4,429,808
203 4,548,336

CLASS 222

96 4,548,337
107 4,548,338
129 4,548,339
135 4,548,340
145 4,548,342
146.6 4,548,341
400.7 4,548,343
464 4,548,344

CLASS 227

58 4,548,345

CLASS 228

47 4,548,346
48 4,548,347
155 Re.32,008

CLASS 229

1.5 H 4,548,348
4,548,349
15 4,548,350
17 G 4,548,352
23 R 4,548,351

CLASS 232

4 R 4,548,353

CLASS 235

380 4,549,075
382 4,549,076
384 4,549,077

CLASS 236

37 4,548,355
345 4,548,354

CLASS 239

126 4,548,356
289 4,548,357
424 4,548,358
434 4,548,359
542 4,548,360
585 4,548,361
685 4,548,362
698 4,548,363

CLASS 242

4 B 4,548,364
4 R 4,548,365
18 DD 4,548,366
84.51 R 4,548,367
129.6 4,548,368
150 R 4,548,369
211 4,548,370

CLASS 244

13 4,548,371

CLASS 248

99 4,548,372
122 4,548,373
123.1 4,548,374
205.2 4,548,375
205.4 4,548,376
219.1 4,548,377
558 4,548,378
624 4,548,379

CLASS 249

106 4,548,380
114 R 4,548,381

CLASS 250

203 R 4,549,078
339 4,549,079
343 4,549,080
372 4,549,081
423 R 4,549,082
458.1 4,549,083
548 4,549,084
551 4,549,085
561 4,549,086
4,549,087
578 4,549,088

CLASS 251

5 4,548,382
129 4,548,383
163 4,548,384
175 4,548,385
327 4,548,386

CLASS 252

8.5 B 4,548,720
8.55 C 4,548,732
8.55 D 4,548,721
33 4,548,722
39 4,548,723
51.5 A 4,548,724
56 R 4,548,725
75 4,548,726
171 4,548,727
174.14 4,548,728
174.21 4,548,729
186.43 4,548,730
299.63 4,548,731
310 4,548,733
311 4,548,734
312 4,548,735
315.1 4,548,736
500 4,548,737
4,548,738
511 4,548,739
4,548,740
518 4,548,741
519 4,548,742
522 R 4,548,743
545 4,548,744
567 4,548,745

CLASS 254

10 B 4,548,387

CLASS 256

32 4,548,388

CLASS 260

104 4,548,746
112 B Re.32,011
239 A 4,548,747
239.5 4,548,749
239.55 C 4,548,748
243.3 4,548,750
245.4 4,548,751
330.9 4,548,752
410 4,548,753
410.9 R 4,548,754
412.8 4,548,755
465 E 4,548,756
502.5 E 4,548,757
502.5 F 4,548,758
4,548,759
4,548,760
508 4,548,761
543 P 4,548,762
989 4,548,763

CLASS 261

75 4,548,764
93 4,548,765
112 4,548,766

CLASS 264

7 4,548,767
12 4,548,768
22 4,548,769
4,548,770
23 4,548,771
26 4,548,772
40.6 4,548,773
44 4,548,774
45.5 4,548,775
50 4,548,776
107 4,548,777
180 4,548,778
255 4,548,779
272.15 4,548,780
315 4,548,781

CLASS 267

64.11 4,548,389
91 4,548,390

CLASS 269

47 4,548,391
156 4,548,392

CLASS 270

59 4,548,393

CLASS 271

9 4,548,394
11 4,548,395
90 4,548,396
121 4,548,397
197 4,548,398
221 4,548,399
226 4,548,400
265 4,548,401
290 4,548,402
296 4,548,403
303 4,548,404

CLASS 272

69 4,548,405
73 4,548,406

CLASS 273

26 R 4,548,407
121 A 4,548,408
126 R 4,548,409
153 R 4,548,411
153 S 4,548,410
156 4,548,412
186 A 4,548,413
367 4,548,414

CLASS 277

100 4,548,415
140 4,548,416

CLASS 279

5 4,548,417

CLASS 280

1 4,548,418
203 4,548,419
224 4,548,420
281 LP 4,548,421
281 R 4,548,422
492 4,548,423
612 4,548,424
808 4,548,425

CLASS 281

29 4,548,426

CLASS 285

55 4,548,427
90 4,548,428
236 4,548,429
256 4,548,430
334 4,548,431

CLASS 290

38 R 4,549,089

CLASS 292

8 4,548,432
49 4,548,433
223 4,548,434
229 4,548,435
292 4,548,436

CLASS 294

86.3 4,548,437

CLASS 296

160 4,548,438
223 4,548,439

CLASS 297

174 4,548,440
239 4,548,441

CLASS 299

10 4,548,442
31 4,548,443
34 4,548,444

CLASS 303

7 4,547,967
22 A 4,548,445

CLASS 307

10 AT 4,549,090
106 4,549,091
116 4,549,092
147 4,549,093
247 A 4,549,094
254 4,549,095
297 4,549,096
326 4,549,097
352 4,549,098
359 4,549,099
362 4,549,100
443 4,549,101
578 4,549,102

CLASS 310

60 R 4,549,103
67 R 4,549,104
87 4,549,105
184 4,549,106
327 4,549,107

CLASS 313

93 4,549,108
485 4,549,109
4,549,110

CLASS 315

3.6 4,549,112
4 4,549,111
14 4,549,113
58 4,549,114
71 4,549,115
200 R 4,549,116
371 4,549,117
393 4,549,118

CLASS 318

11 4,549,119
254 4,549,120
301 4,549,121
338 4,549,122
610 4,549,123
663 4,549,124
4,549,125
696 4,549,126

CLASS 320

21 4,549,127

CLASS 322

99 4,549,128

CLASS 323

276 4,549,129
308 4,549,130
354 4,549,131

CLASS 324

54 4,549,132
60 R 4,549,133
61 R 4,549,134
248 4,549,135
308 4,549,136
309 4,549,137
4,549,138
4,549,139
4,549,140
441 4,549,141

CLASS 329

50 4,549,142
126 4,549,143

CLASS 330

4.3 4,549,144
51 4,549,145
149 4,549,146
297 4,549,147

CLASS 331

1 A 4,549,148
66 4,549,149
111 4,549,150

CLASS 332

9 R 4,549,151
23 R 4,549,152

CLASS 335

16 4,549,153
87 4,549,154
212 4,549,155
216 4,549,156
303 4,549,157

CLASS 336

83 4,549,158

CLASS 337

301 4,549,159
4,549,160

CLASS 338

20 4,549,161
28 4,549,162

CLASS 339

2 A 4,548,446
3 S 4,548,454
14 R 4,548,447
17 C 4,548,448
4,548,450
4,548,453
17 M 4,548,451
17 R 4,548,452
45 M 4,548,455
75 MP 4,548,456
88 R 4,548,457
89 R 4,548,458
97 P 4,548,459
107 4,548,460
154 L 4,548,449
217 R 4,548,461
266 R 4,548,462

CLASS 340

52 R 4,549,163
59 4,549,164
347 CC 4,549,165
347 DA 4,549,166
347 DD 4,549,167
525 4,549,168
539 4,549,169
568 4,549,170
605 4,549,171
703 4,549,172
726 4,549,173
784 4,549,174
794 4,549,175
825.31 4,549,176
825.57 4,549,177

825.58 4,549,178
825.69 4,549,179
870.04 4,549,180
904 4,549,181
942 4,549,182

CLASS 343

7 A 4,549,183
11 R 4,549,184
368 4,549,185
748 4,549,186
897 4,549,187

CLASS 346

1.1 4,549,188
76 PH 4,549,189
108 4,549,190
140 R 4,549,191
218 4,549,192

CLASS 350

3.71 4,548,463
96.14 4,548,464
96.20 4,548,465
4,548,466
96.21 4,548,467
117 4,548,468
128 4,548,469
129 4,548,470
255 4,548,471
276 R 4,548,472
311 4,548,473
333 4,548,474
334 4,548,475
350 S 4,548,476
358 4,548,477
377 4,548,478
404 4,548,479
432 4,548,480
559 4,548,481
608 4,548,482
635 4,548,483

CLASS 351

123 4,548,484

CLASS 353

67 4,548,485
95 4,548,486
120 4,548,487

CLASS 354

402 4,548,488

CLASS 355

3 DD 4,548,489
4,548,490
3 R 4,548,491
50 4,548,492
125 4,548,493

CLASS 356

73.1 4,548,494
123 4,548,495
213 4,548,496
312 4,548,497
318 4,548,498
4,548,499
336 4,548,500
350 4,548,501
358 4,548,502
373 4,548,503
375 4,548,504
445 4,548,505
446 4,548,506

CLASS 357

22 4,549,193
30 4,549,194
4,549,195
35 4,549,196
41 4,549,197
42 4,549,198
68 4,549,199
80 4,549,200

CLASS 358

13 4,549,201
17 4,549,202
34 4,549,203
93 4,549,204
106 4,549,205
4,549,206
107 4,549,207
108 4,549,208
111 4,549,209
112 4,549,210
126 4,549,211
167 4,549,212
4,549,213
172 4,549,214
213 4,549,215
242 4,549,216
243 4,549,217
4,549,218
257 4,549,219
283 4,549,220
288 4,549,221
296 4,549,222
300 4,549,223
310 4,549,224
316 4,549,225
328 4,549,226
4,549,227
342 4,549,228

CLASS 360

8 4,549,229
4,549,230
10.2 4,549,234
4,549,235
14.2 4,549,231
19.1 4,549,236
71 4,549,237
77 4,549,232
90 4,549,233
103 4,549,238
105 4,549,239
133 4,549,240

CLASS 361

45 4,549,241
115 4,549,242
228 4,549,243
229 4,549,244
284 4,549,245
293 4,549,246
398 4,549,247
400 4,549,248

CLASS 362

33 4,549,249
96 4,549,250
216 4,549,251
4,549,252
364 4,549,253

CLASS 363

21 4,549,254
26 4,549,255
39 4,549,256
61 4,549,257
71 4,549,258
137 4,549,259

CLASS 364

143 4,549,260
183 4,549,261
200 4,549,262
4,549,263
4,549,273
406 4,549,264
414 4,549,265
426 4,549,266
463 4,549,267
470 4,549,268
472 4,549,269
474 4,549,270
4,549,271
478 4,549,272
492 4,549,274
513 4,549,276
521 4,549,275
559 4,549,277
567 4,549,278
709 4,549,279
738 4,549,280
900 4,549,281

CLASS 365

1 4,549,282
194 4,549,283
222 4,549,284

CLASS 366

20 4,548,507
195 4,548,508
349 4,548,509

CLASS 367

60 4,549,285
97 4,549,286

CLASS 368

9 4,548,513
10 4,548,510
4,548,511
15 4,548,512
291 4,548,514

CLASS 369

45 4,549,287
48 4,549,288
53 4,549,289

CLASS 370

32 4,549,290
89 4,549,291
4,549,292
95 4,549,293
111 4,549,294

CLASS 371

13 4,549,295
16 4,549,296
33 4,549,297
40 4,549,298

CLASS 372

18 4,549,299
50 4,549,300

CLASS 373

108 4,549,301

CLASS 374

56 4,548,515
135 4,548,516
143 4,548,517
198 B1 4,445,789

CLASS 375

8 4,549,302
25 4,549,303
27 4,549,304
4,549,305

CLASS 376

127 4,548,782
204 4,548,783
216 4,548,784
249 4,548,785

CLASS 378

58 4,549,306
145 4,549,307

CLASS 381

43 Re.32,012

CLASS 384

490 4,548,518

CLASS 400

61 4,548,519
63 4,548,520
124 4,548,521
4,548,522
617 4,548,523

CLASS 401

187 4,548,524

CLASS 405

52 4,548,525
233 4,548,526
283 4,548,528
294 4,548,527

CLASS 406

53 4,548,529

CLASS 408

79 4,548,530

CLASS 409

9 4,548,531
233 4,548,532

CLASS 411

55 4,548,533
61 4,548,534

CLASS 414

111 4,548,535
225 4,548,536
276 4,548,537
332 4,548,538
412 4,548,539
463 4,548,540
479 4,548,541
549 4,548,542
686 4,548,543
751 4,548,544

CLASS 415

90 4,548,545
133 4,548,546
170 A 4,548,547

CLASS 416

189 4,548,548

CLASS 417

53 4,548,549
390 4,548,550
393 4,548,551
417 4,548,552
477 4,548,553
572 4,548,554

CLASS 418

55 4,548,555
4,548,556
76 4,548,557
83 4,548,558
136 4,548,559
144 4,548,560
184 4,548,561
189 4,548,562

CLASS 419

29 4,548,786

CLASS 422

15 4,548,787
109 4,548,788
160 4,548,789

CLASS 423

9 4,548,790
22 4,548,791
65 4,548,792
92 4,548,793
123 4,548,794
126 4,548,795
175 4,548,796
240 4,548,797
263 4,548,798
351 4,548,799
510 4,548,800
578 R Re.32,009
594 4,548,801
659 4,548,802
4,548,803

CLASS 424

9 4,548,804
4,548,805
19 B1 4,389,393
35 4,548,806
45 4,548,807
47 4,548,808
52 4,548,809
59 4,548,810
71 4,548,811
78 4,548,812
95 4,548,813
4,548,814
114 4,548,815
116 4,548,816
118 4,548,974
127 4,548,817
253 4,548,819

CLASS 425

2 4,548,563
32 4,548,564
64 4,548,565
110 4,548,566
113 4,548,567
131.1 4,548,568
133.1 4,548,569
141 4,548,570
297 4,548,571
388 B1 4,439,130
410 4,548,572
442 4,548,573
531 4,548,574

CLASS 426

3 4,548,821
96 4,548,822
104 4,548,823
111 4,548,824
4,548,852
383 4,548,825
394 4,548,826
427 4,548,827
477 4,548,828
518 4,548,829
620 4,548,830
634 4,548,831

CLASS 427

34 4,548,832
44 4,548,833
63 4,548,834
96 4,548,879
123 4,548,835
160 4,548,836
209 4,548,837
282 4,548,838
345 4,548,839
365 4,548,840
372.2 4,548,841
407.2 4,548,842

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40 4,548,845
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322.7 4,548,861
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325 4,548,863
336 4,548,864
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398 4,548,866
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474.7 4,548,869
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593 4,548,871
633 4,548,872
695 4,548,873

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39 4,548,876
41 4,548,877
50 4,548,878
162 4,548,880
194 4,548,881
211 4,548,882

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70 4,548,886
213 4,548,887
223 4,548,888
273 4,548,889
4,548,894
280 4,548,890
283 4,548,891
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296 4,548,893
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332 4,548,896
351 4,548,897
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350 4,548,578

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4,548,083	4,548,599	4,549,294	4,548,006	4,548,519	4,549,306
4,548,087	4,548,641	4,549,307	4,548,228	4,548,572	4,429,808
4,548,496	4,548,661	08 : 4,547,929	4,548,243	4,548,589	19 : 4,547,920
04 : 4,547,972	4,548,662	4,548,021	4,548,245	4,548,593	4,547,984
4,547,990	4,548,681	4,548,198	4,548,257	4,548,600	4,548,114
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06 : Re.32,011	4,548,710	4,548,608	4,548,449	4,548,652	4,548,388
4,547,904	4,548,714	4,548,650	4,548,586	4,548,676	4,548,766
4,547,926	4,548,722	4,548,702	4,548,594	4,548,701	4,549,010
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4,547,966	4,548,767	4,549,210	4,548,607	4,548,752	4,548,362
4,547,983	4,548,770	4,549,264	4,548,627	4,548,776	4,548,912
4,547,991	4,548,783	4,549,267	4,548,828	4,548,790	4,548,997
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4,548,026	4,548,812	4,548,162	1,030,035	4,548,846	4,548,150
4,548,033	4,548,901	4,548,190	13 : 4,547,921	4,548,851	4,548,341
4,548,157	4,548,908	4,548,248	4,547,924	4,548,967	4,548,700
4,548,159	4,548,930	4,548,255	4,548,289	4,549,035	4,548,963
4,548,199	4,548,949	4,548,297	4,548,382	4,549,038	4,549,279
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4,548,263	4,549,053	4,548,531	4,548,249	4,549,311	4,548,688
4,548,266	4,549,063	4,548,668	17 : 4,547,943	4,412,573	4,548,782
4,548,269	4,549,064	4,548,713	4,547,981	4,439,130	4,548,805
4,548,281	4,549,068	4,548,730	4,548,076	18 : 4,547,959	4,549,081
4,548,298	4,549,073	4,548,791	4,548,104	4,547,995	4,549,185
4,548,326	4,549,080	4,548,807	4,548,107	4,548,049	4,549,195
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4,548,365	4,549,110	4,549,058	4,548,193	4,548,293	4,547,961
4,548,374	4,549,136	4,549,084	4,548,204	4,548,294	4,547,986
4,548,392	4,549,144	4,549,109	4,548,212	4,548,306	4,548,075
4,548,428	4,549,145	4,549,241	4,548,227	4,548,331	4,548,115
4,548,435	4,549,146	4,549,249	4,548,232	4,548,337	4,548,117
4,548,468	4,549,155	4,549,281	4,548,250	4,548,368	4,548,142
4,548,470	4,549,159	4,549,299	4,548,254	4,548,434	4,548,207
4,548,479	4,549,160	10 : 4,547,933	4,548,277	4,548,651	4,548,218
4,548,491	4,549,161	4,548,638	4,548,303	4,548,924	4,548,242
4,548,493	4,549,179	4,548,741	4,548,317	4,548,925	4,548,371
4,548,500	4,549,187	4,548,742	4,548,329	4,549,052	4,548,384
4,548,506	4,549,211	4,548,943	4,548,349	4,549,072	4,548,385
4,548,523	4,549,240	4,548,946	4,548,357	4,549,089	4,548,501
4,548,533	4,549,262	4,548,968	4,548,408	4,549,157	4,548,548
4,548,542	4,549,272	4,548,978	4,548,450	4,549,202	4,548,773
4,548,574	4,549,275	11 : 4,548,510	4,548,508	4,549,203	4,548,857
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